PIT AND QUARRY

Per

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SERIAL RECORD
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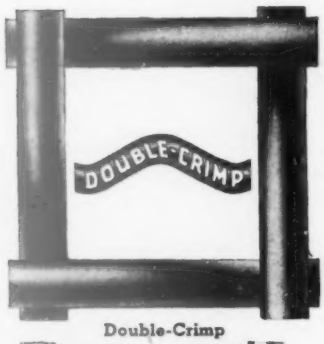
FOR 26 YEARS THE LARGEST PRODUCER CIRCULATION IN THE FIELD

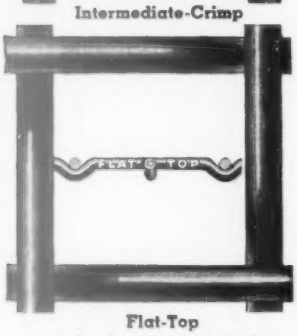
DEC 30 1943



Double-Crimp

Arch-Crimp

Intermediate-Crimp



Flat-Top

"The Perfect"

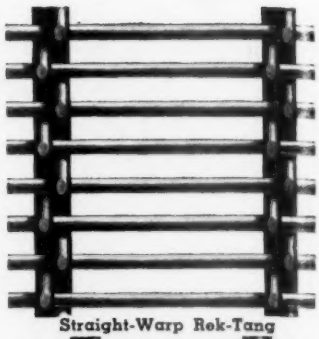
Wire Cloths and Screens

of

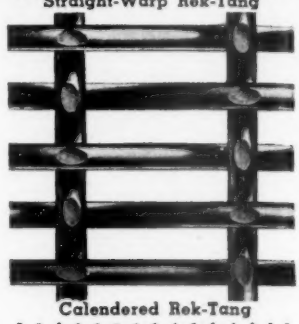
SUPER-LOY
STEEL
GALVANIZED STEEL
STAINLESS STEEL
NICKEL-CHROME STEEL
PHOSPHOR BRONZE
BRASS
COPPER
MONEL
NICKEL
ALUMINUM

•

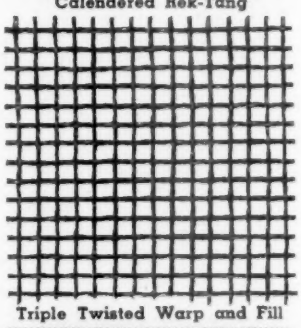
Any Special Metal for Any Service



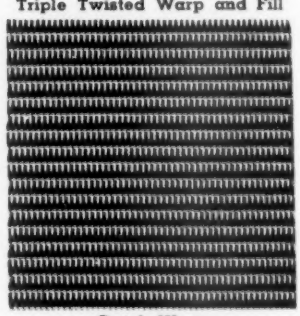
Straight-Warp Rek-Tang



Calendered Rek-Tang



Triple Twisted Warp and Fill



Dutch Weave

"Perfect" WEAVES

Arch-Crimp	Rek-Tang
Coiled	Selvage-Edge
Double-Crimp	Straight-Warp
Double-Fill	Stranded
Dutch	Sta-Tru
Flat-Top	Triple-Warp
Intermediate-Crimp	Twilled
	Twisted-Fill
	Twisted-Warp

"Perfect" PROCESSING

Arc-Welding	Cutting	Galvanizing	Shearing
Bending	Dipping	Jointing	Slitting
Binding	Dishing	Knuckling	Soldering
Brazing	Finishing	Painting	Spot-Welding
Calendering	Flanging	Rolling	Squaring
Coiling	Flattening	Selvaging	Stitching
Crimping	Forming	Shaping	Tack Welding
	Framing		Trimming

"Perfect" PRODUCTS

Baskets	Panels
Circles	Pieces
Coils	Ribbons
Cones	Rings
Cylinders	Rolls
Discs	Sections
Forms	Segments
Leaves	Strips
Lengths	Templates

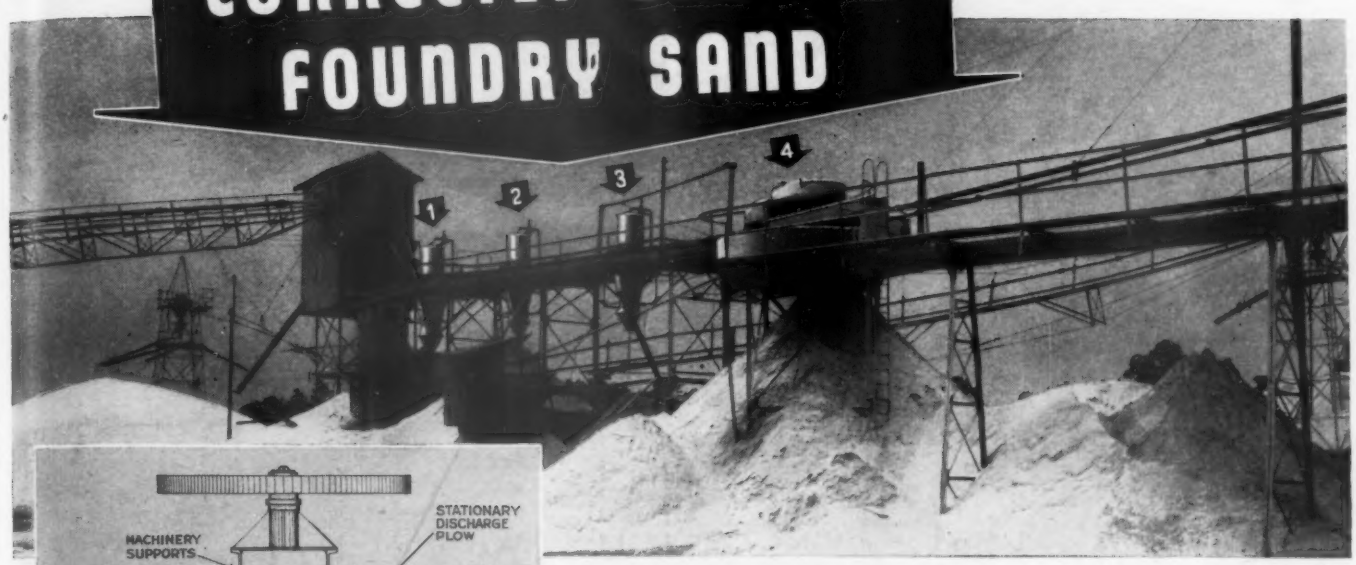
Illustrations show items listed in bold-face type. Other wire cloths and screens will be illustrated in subsequent advertisements of this series.

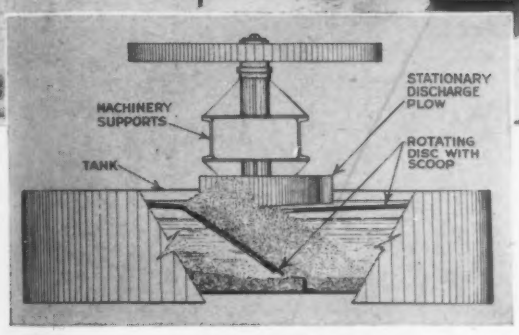
Coil Screen

THE LUDLOW-SAYLOR WIRE CO.

ST. LOUIS, MISSOURI

CORRECTLY GRADED FOUNDRY SAND





Produced by LINK-BELT CLASSIFIERS

THE ROTOSCOOP

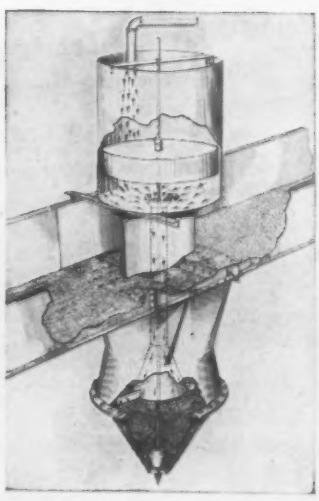
is an unusually efficient, highly flexible, self-contained, compact dewatering unit for all types of sand. It provides a simple method of recovering special grain sizes usually lost in the overflow water. Delivers sand dry enough for loading on trucks or conveyors. Made in four sizes—15′, 12′, 9′ and 6′ diameters, with capacities 20 to 150 tons per hour.

Whitehead Bros. Co's No. 1 sand and gravel plant at Dividing Creek, N. J., illustrated above, is an outstanding example of modern equipment doing a vital wartime job with precision and economy. This plant is capable of producing seven grades of sand to A.F.A. standards with three Link-Belt Shaw classifiers and a Link-Belt Rotoscoop. The 30-inch classifier (1 in illustration) can be adjusted to produce three grades, the 24-inch classifiers (2 and 3), and the 12-ft. Rotoscoop (4), produce one grade each, while the overflow from the Rotoscoop, held in a settling basin, recovers a very fine grade.

Their Number Two plant uses two Link-Belt conical screens for scalping over-14-mesh material. In the two drying plants, Link-Belt vibrating screens receive sand discharged from the dryers and operate as stationary or vibrating screens.

THE SHAW CLASSIFIER

This unit will not only produce clean commercial sand but will also make such special grades as asphalt, filter, engine, gypsum and glass sands. Sand graded and cleaned by this unit will meet the most exacting specifications, particularly where removal of fines is important.



LINK-BELT COMPANY

Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Dallas 1, Minneapolis 5, San Francisco 24, Toronto 8. Offices, warehouses and distributors in principal cities.

9341

LINK-BELT

SAND AND GRAVEL HANDLING AND PREPARATION EQUIPMENT

PIT AND QUARRY, December, 1943. Vol. 36. No. 6. Published monthly by the Complete Service Publishing Company, 538 South Clark Street, Chicago 5, Ill. Subscription price $2 for 1 year in the U. S. and possessions, Canada, Central and South America; elsewhere $1 additional for each year. Single copies 25 cents. Entered as second-class matter February 28, 1932, at the Post Office at Chicago, Ill., under the Act of March 3, 1897.

Maintenance *will be* DOUBLY IMPORTANT *after the war...*

Look into this RIGHT-ANGLE BEARING LOADING *now*...

The hours spent on maintenance, the production lost through repair shutdowns, bulk large in management thinking today. Tomorrow, when operating costs spell either competitive advantage or handicap, control of maintenance time and cost will be *doubly* important. That's why Rollway's Right-Angle Bearing Loading may be the decisive factor in your sales results.

Right-Angle Bearing Loading Cut Maintenance Time & Cost

When load magnitudes are large . . . when thrust forces are continuous, intermittent or reciprocal . . . Rollway's Right-Angle Bearing Loading definitely improves bearing life and reduces maintenance cost:

1. by splitting the load into its two simplest components of pure radial and pure thrust.
2. by carrying each of these components on separate bearing assemblies, thereby reducing the magnitude of load per bearing.
3. by eliminating all compound loads, all oblique loads and their resultants.
4. by using the full strength of a *complete roller assembly* to meet the stresses of thrust loads.

No Compound Loads
No Oblique Loads

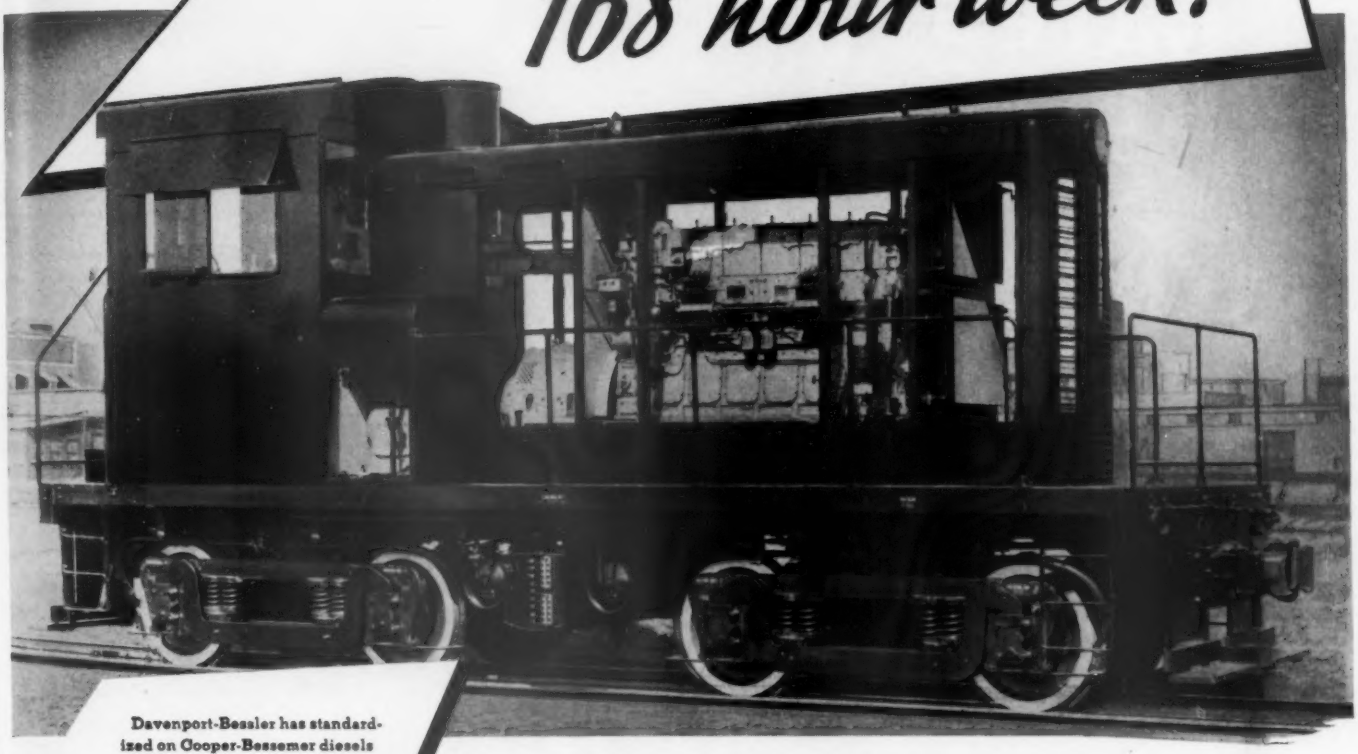
- **ALL thrust loads are carried at right angles to the roller axis.**
- **ALL radial loads are carried at right angles to the roller axis.**

★ **DON'T WAIT** until the urgency of postwar reconversion and redesign are crowding you. Investigate Right-Angle Bearing Loading now. Send us sketches or drawings for free bearing analysis and recommendation today. Or ask for a Rollway catalog, showing hundreds of series in S.A.E., or American Standard metric dimensions and tolerances.

ROLLWAY BEARING COMPANY, INC., SYRACUSE, NEW YORK

BUILDING HEAVY-DUTY BEARINGS SINCE 1908 **BEARINGS**

All set for her 168 hour week!



Davenport-Bessler has standardized on Cooper-Bessemer diesels for their larger heavy duty switchers. This particular design combines a pleasing appearance with complete accessibility as illustrated in the above engine with its cab doors open.

HITLER is learning about two old-time American weapons; **HARD WORK** and **GOOD MACHINES.** In Cooper-Bessemer diesels you'll find both, for Cooper-Bessemer engines give low-cost, dependable power and continuous, uninterrupted service.

In mills battling to increase their tonnage, heavy switchers like the model shown above are putting in 160 and 168 hour weeks regularly as a matter of course. Powered by Cooper-Bessemer, they're available more than 95% of the time.

These "three-shift" locomotives, powered by Diesels that can stay on the job all day long and all week long without a substitute, are helping in the fight to beat the Axis. And they're saving money for their owners.

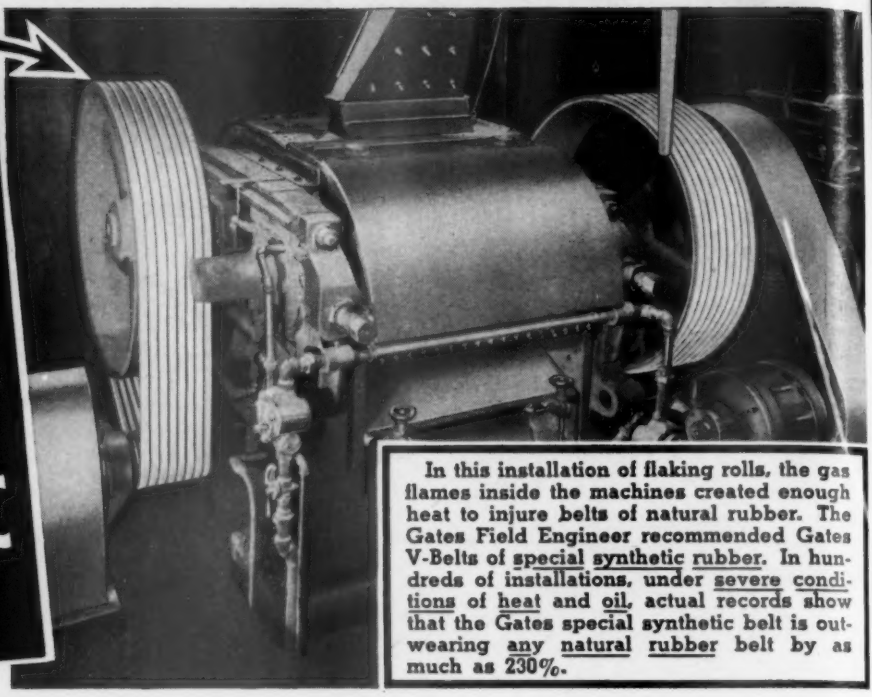
THE **Cooper-Bessemer** CORPORATION

MOUNT VERNON, OHIO GROVE CITY, PENNA.

BUILDERS OF DEPENDABLE ENGINES FOR 110 YEARS

Here The Gates Field Engineer Recommended

GATES BELTS of Special SYNTHETIC RUBBER



In this installation of flaking rolls, the gas flames inside the machines created enough heat to injure belts of natural rubber. The Gates Field Engineer recommended Gates V-Belts of special synthetic rubber. In hundreds of installations, under severe conditions of heat and oil, actual records show that the Gates special synthetic belt is outwearing any natural rubber belt by as much as 230%.

He Can Tell You Whether You Need . . . .

❶ Synthetic Rubber V-Belts

❷ Steel Cable V-Belts

❸ Cotton Cord V-Belts

❹ Static-Safety V-Belts

❺ Rayon Cord V-Belts

Whenever a drive in your plant appears to be wearing belts out faster than it should—just pick up your phone and call the Gates Field Engineer.

He is a specialist in drive operation and he can quickly diagnose any trouble you are having. In most cases he can correct that trouble very easily and without recourse to using V-Belts of special structure.

There are, however, countless drives where V-Belts having special characteristics will prove to be the most efficient and economical that you can use.

The flaking rolls, pictured above, are a case in point. For more than five years now, Gates has been making special synthetic V-Belts—and the records in hundreds of applications show that, under severe conditions of heat and oil, these special synthetic belts are wearing 2 times to 2½ times as long as any belt of natural rubber.

There are other types of drives on which V-Belts with load-carrying members composed of flexible steel cables — or of rayon cords — will prove to be the most desirable application. Again, a Static-Safety V-Belt may best fit your special needs.

In any case, the wisest move you can make is to phone your Gates Field Engineer. Your telephone directory will give you his number. He will put all of his specialized knowledge and experience at your disposal—and he will always recommend the practice that will be most efficient and economical for you.

4312.

THE GATES RUBBER COMPANY

Engineering Offices and Stocks in All Large Industrial Centers

GATES VULCO ROPE DRIVES

CHICAGO, ILL. 549 West Washington
NEW YORK CITY 215-219 Fourth Avenue
ATLANTA, GA. 738 C & S National Bank Building
LOS ANGELES, CAL. 2240 East Washington Boulevard
DENVER, COLO. 999 South Broadway
DALLAS, TEXAS 2213 Griffin Street
PORTLAND, ORE. 333 N. W. 5th Avenue
SAN FRANCISCO, CAL. 1090 Bryant Street

GULF LUBRICANTS AND FUELS *help speed work on another important flight strip*

"Gulf Quality Petroleum Products have proven effective insurance against unnecessary delays due to mechanical failures and breakdowns,"

. . . says Superintendent Bill Burton

GRADING upwards to 15,000 yards of earth each day, the Mecklenburgh Construction Company of Durham, N. C. is rushing the flight strip, shown above, to completion ahead of schedule. Their equipment has made an exceptional performance record on this job with Gulf lubricants and fuels in service.

Like many other contractors doing rush war work throughout the country, this organization has found Gulf products provide maximum protection when equipment is pushed to the limit. Gulf fuels and lubricants are scientifically manufactured to meet the most exacting requirements.

Call in a Gulf Service Engineer today and ask him to check over your equipment. He will recommend lubricants and fuels best suited to your particular equipment and operating conditions.

The Gulf line of more than 400 quality products—are available to you through 1200 warehouses located in 30 states from Maine to New Mexico. Write or 'phone your nearest Gulf office today.

GULF

GULF OIL CORPORATION
GULF REFINING COMPANY
GULF BUILDING, PITTSBURGH, PA.

SPEED THE DAY OF VICTORY ★ BUY MORE WAR BONDS AND STAMPS

BUY TO LAST
SAVE TO WIN

In duststorm or deluge

DEPEND ON AN EXIDE

Equipment isn't babied in "off-the-highway" operations. It's out there working under all conditions, in tropical heat, arctic cold, snow, wind, and rain.

Naturally, your equipment must be rugged to stand up under such treatment . . . and that statement is doubly true of your batteries. Exide Batteries, built to meet the special needs of "off-the-highway" work, are completely dependable, long-lived, and so easy to keep in shape that any workman on your payroll can do a competent maintenance job.

The answers to dozens of Heavy Duty Battery Problems are found in Exide's new catalog addressed to this field. Write *today* for your free copy. Here's information written to be used and understood.

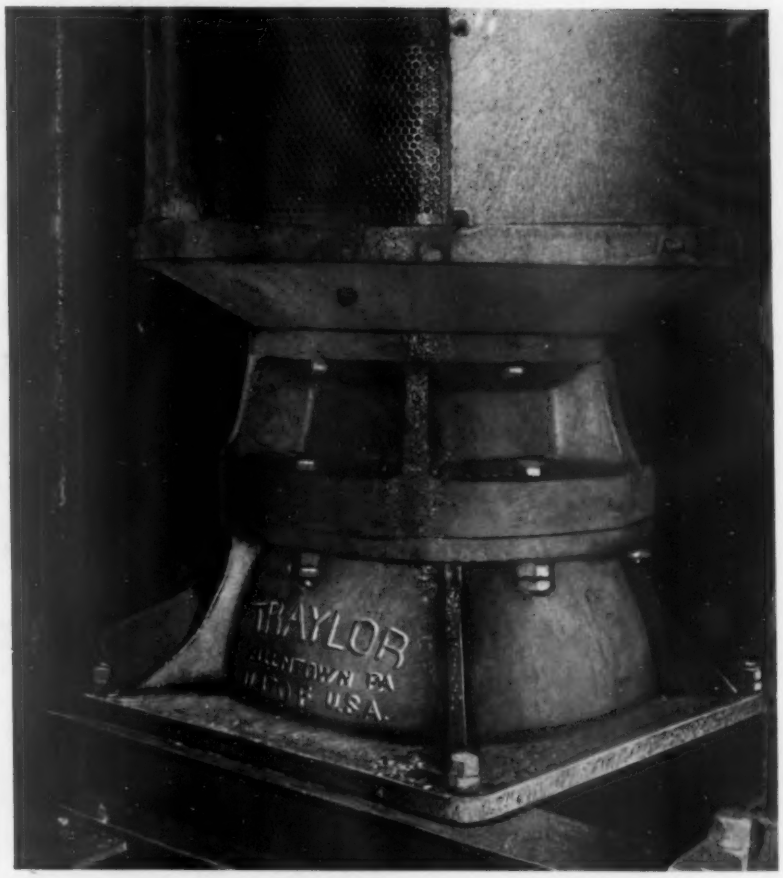
THE ELECTRIC STORAGE BATTERY CO.
Philadelphia 32
Exide Batteries of Canada, Limited, Toronto

ARMY E NAVY
Exide
HEAVY DUTY
BATTERIES

TRAYLOR

Type TY

REDUCTION CRUSHER



WE BUILD

Rotary Kilns
Rotary Coolers
Rotary Dryers
Rotary Slakers
Scrubbers
Evaporators
Jaw Crushers
Gyratory Crushers
Reduction Crushers
Crushing Rolls
Grinding Mills
Ball Mills
Rod Mills
Tube Mills
Pug Mills
Wash Mills
Feeders
Rotary Screens
Elevators

Eight features of this great crusher add up to advantages that enable owners to reap extra profits:—(1) it delivers exactly the kind of product required, of the right size, in satisfying capacity; (2) it has strength enough, and to spare, to stand up under its job (built of steel throughout); (3) it extracts the last ounce of wearing metal (the patented Bell Head and Curved Concaves take care of this by eliminating choking), it is otherwise inexpensive to maintain (automatic force-feed lubrication), and it is economical in the use of power (cut gearing and roller bearings); (4) it is fool proof (assured by protective devices against dust and tramp metal).

Write us — today — for the whole story!

SEE BULLETIN 3112

TRAYLOR

ENGINEERING & MANUFACTURING CO.

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B. C. EQUIPMENT CO., LTD.
551 Howe St., Vancouver, B. C.

Export Department — 104 Pearl St., New York City. Foreign Sales Agencies: London, Lima, Rio de Janeiro, Buenos Aires, Santiago, Antofagasta, Oruro, Montevideo.

B&W ELVERITE TUBE MILL CASTINGS

. . . will be assured by this shipment of B&W Elverite Tube Mill Castings.

These advantages are of great importance with the present-day critical manpower situation, and they will be of equally great importance from the standpoint of economical operation in the post-war period.

For economy and quality, specify Elverite.

BABCOCK & WILCOX

THE BABCOCK & WILCOX COMPANY
85 LIBERTY STREET, NEW YORK 6, N.Y.

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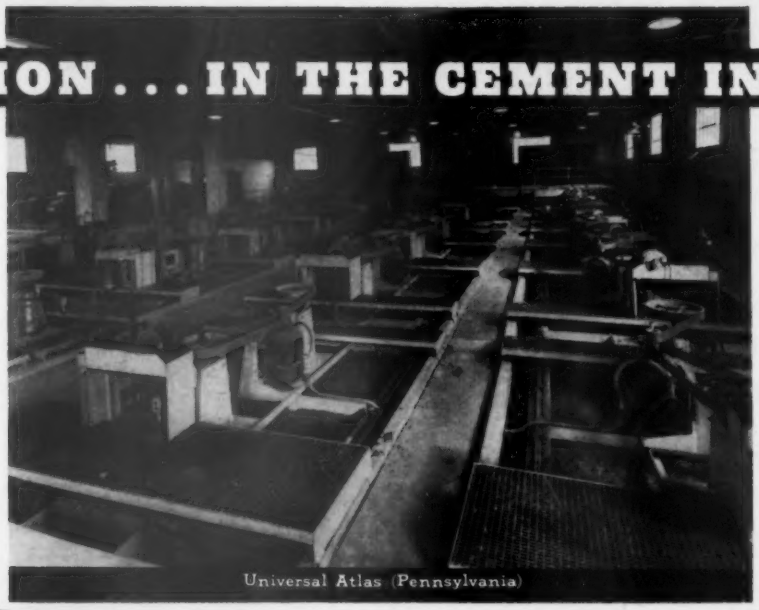
Valley Forge (Pennsylvania)

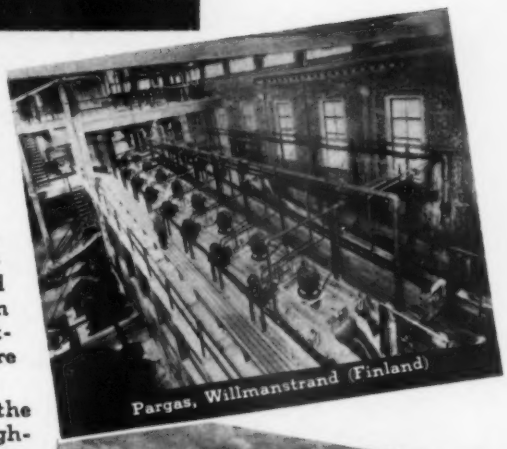
Permanente (California)

FLOTATION . . . IN THE CEMENT INDUSTRY



Universal Atlas (Pennsylvania)

Alpha Cem. Co., Ltd. (South Africa)



Pargas, Willmanstrand (Finland)

Seventy percent of all the new cement plant capacity built (in U.S.A.) since 1932 installed flotation.

The process extends the life of raw material deposits. Cement of the highest quality and uniformity can be produced from inferior raw materials, permitting the use of deposits heretofore considered unsuitable.

Benefits through the use of the Breerwood Process range throughout most of the operating departments of a cement plant. In some instances the saving in quarry operation alone more than offsets the cost of flotation.

We design and equip complete plants for handling cement raw materials. Our laboratory is fully equipped for test work on an experimental or commercial scale. Write us for particulars.

National (Pennsylvania)

Argentine Port. Cem. Co. (South America)

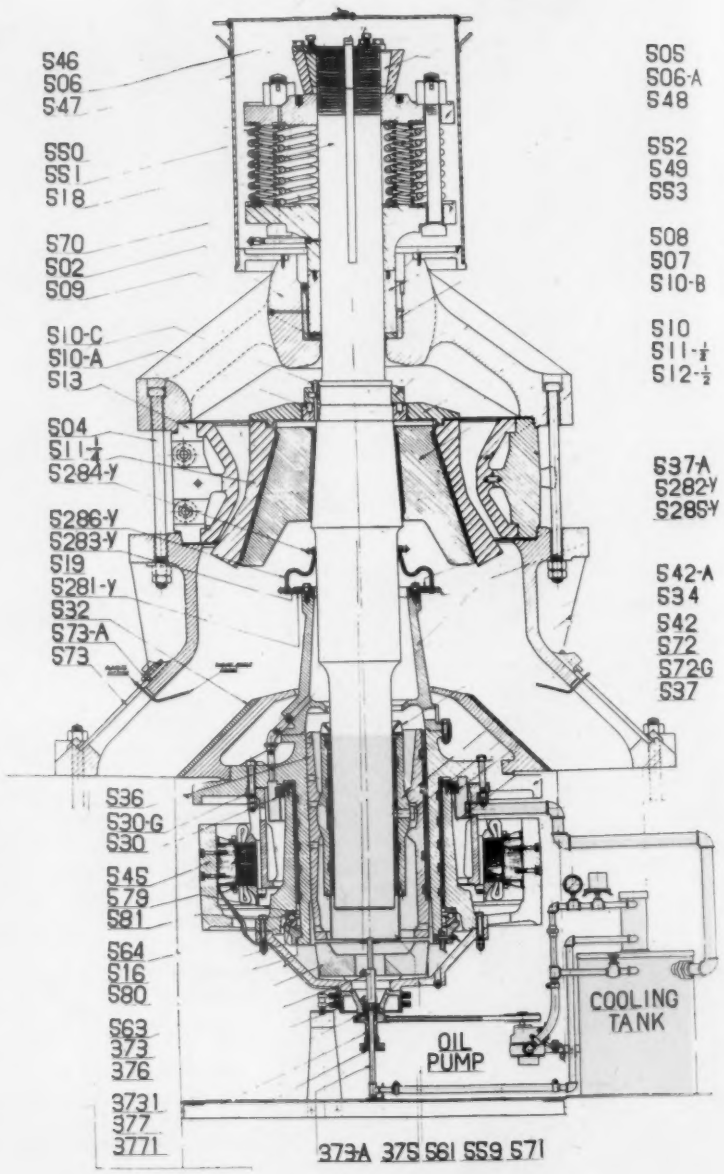
SEPARATION PROCESS COMPANY

CATASAUQUA, PENNSYLVANIA

Look Into a Kennedy Reduction Ball Bearing Gearless Crusher

A POSITIVE OILING SYSTEM

The oiling system of the Kennedy gearless crusher is positive, simple, and fool-proof. The oil is continuously filtered and cooled. A simple gear pump draws the oil from a serpentine-cooled tank and under pressure pumps it through a filter and, by suitable conduit, to a compartment that fits below the ball socket bearing. The oil is forced up this bearing around the shaft whence it overflows to the eccentric and pulley bearings, flooding the ball bearing and finally overflowing to the storage tank. Provision is made with a by-pass to release the pressure back into the storage tank, thus maintaining constant and even flow at all times. An electrical signal is connected in the circuit so that if the oil pressure is failing, a warning is given the operator by horn or light or both, as conditions demand. Prompt attention to any irregularity can save the bearings of a crusher.



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Engineers
Designers
Fabricators

KENNEDY VAN SAUN MFG. & ENG. CORP.
2 PARK AVE., NEW YORK, N. Y.

Crushing
Grinding
Calcining

TODAY AS ALWAYS FOR EFFICIENT DIGGING

MOVE MATERIAL THE SHORTEST DISTANCE IN THE SHORTEST TIME

Are you sure you are getting the most out of your excavating equipment? That your job setup takes full advantage of the primary factors of Distance and Time to secure efficiency and long life?

Under pressure of continuous 3-shift wartime operation, on-the-job compromises may bring about alterations in your planned setup which result in lowered production. To overcome this, owners and operators will find it advantageous to make occasional checkups of their machines and methods.

As a guide to such a fresh and critical approach, we have prepared a booklet filled with down-to-earth suggestions. Ideas for the operator, tips on maintenance and the importance of adjustments, brass-tack discussion on lubrication, power plant servicing, hints on efficient handling of shovel, crane and dragline and on the importance of observing safety rules — all are presented in simple, readable form which we believe every owner and operator will find useful. A copy is yours for the asking from your Bucyrus-Erie distributor; or if you prefer, write us direct.

This 32 page, 5½ x 8¼" booklet, attractively illustrated and printed in two colors, is packed with practical, experience-tested suggestions on how to maintain maximum excavator production. The material applies to any make of excavator, any size. Extra copies available for your operators and foremen.

KEEP EVERY EXCAVATOR PRODUCING AT MAXIMUM EFFICIENCY

Bucyrus-Erie

V-29 C

SOUTH MILWAUKEE, WISCONSIN, U. S. A.

WHAT IS MACHINERY'S No. 1 ESSENTIAL?

. . IT'S LUBRICATION OF THE RIGHT KIND that will keep production machines in good operating condition and continuously on the job. Idle machines due to worn bearings, gears or chains, caused by improper lubrications are certainly on the blacklist these days . . . and remember that machine replacement parts are most difficult to get. Yes—the No. 1 essential today is proper lubrication.

★ ★

7 QUICK FACTS ABOUT LUBRIPLATE LUBRICANTS

1. *LUBRIPLATE produces an ultra-smooth, wear-resisting bearing surface.*
2. *LUBRIPLATE reduces friction, thus lowering maintenance and power costs.*
3. *LUBRIPLATE resists rust, corrosion and pitting.*
4. *Most LUBRIPLATE products are white. LUBRIPLATE assures clean lubrication.*
5. *LUBRIPLATE outlasts ordinary lubricants many times.*
6. *LUBRIPLATE is economical—a little goes a long way.*
7. *LUBRIPLATE is available in fluid and grease types for every need.*

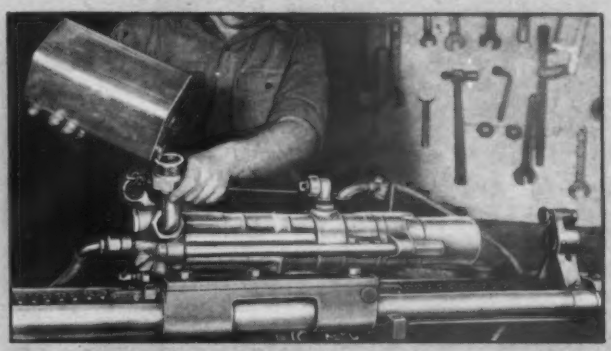
LUBRIPLATE DIVISION
FISKE BROTHERS REFINING COMPANY
SINCE 1870
Newark, N. J. Toledo, Ohio
DEALERS FROM COAST TO COAST

LUBRIPLATE
THE MODERN LUBRICANT *that Arrests Progressive wear*
"Its the Film"

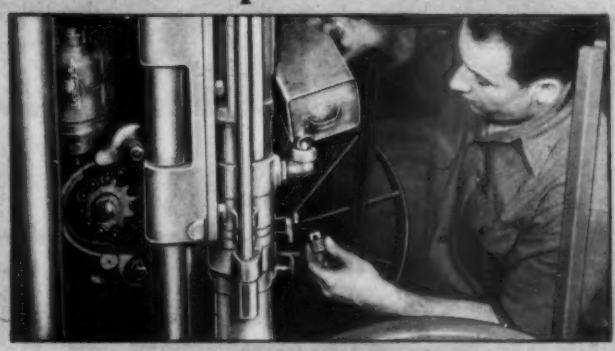
Speed Drilling, Reduce Costs with Regular Lubrication

Although rugged and powerful . . . designed for heavy duty, high speed, deep-hole drilling . . . CP G-200 Wagon Drills are easily and quickly operated by one man. They need but little maintenance care – but they do need that little! Keep them tight and lubricate them regularly.

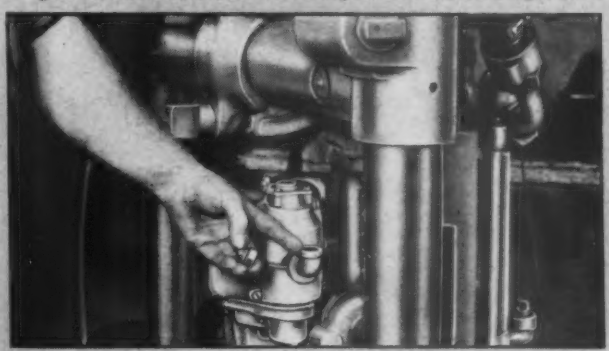
HOW TO GET MAXIMUM SERVICE FROM YOUR CP WAGON DRILL



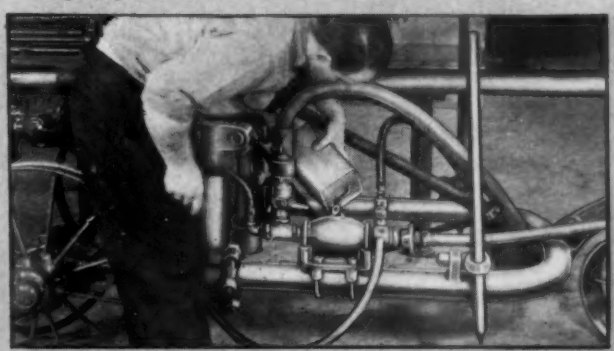
1 Put about four ounces of fairly heavy oil in the gooseneck and blow through before starting work.



2 Fill rock drill oil reservoir with half a pint of right grade of rock drill oil before every shift.



3 Check gear case frequently, keep filled to plug level. Should have regular attention once a week.



4 Always fill the line oiler twice each day when wagon drill is in operation. Capacity, one pint.

★★★★★★★★
PNEUMATIC TOOLS
ELECTRIC TOOLS
(Hicycle...Universal)
ROCK DRILLS

CHICAGO PNEUMATIC
TOOL COMPANY
General Offices: 8 East 44th Street, New York 17, N. Y.

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AIR COMPRESSORS
VACUUM PUMPS
DIESEL ENGINES
AVIATION ACCESSORIES

IN WAR PROJECT CONSTRUCTION
KOEHRING
IT'S THE POWER AND SPEED THAT COUNTS!
Koehring speed and power saves seconds in shovel operations . . . the surest way to increase production. Victory demands a greater output, and Koehring Shovels have the reserve power to provide it. The wartime service needed is available in your Koehring Shovel with little time out for breakdown or repair. Be sure to keep your shovel well lubricated . . . replace worn parts before failure . . . never misuse your shovel in any way . . . and it will exhibit a performance that counts in increasing production.
KOEHRING COMPANY
Milwaukee, Wisconsin
DEPEND ON YOUR KOEHRING DISTRIBUTOR
to help you keep your equipment operating. Care for your Koehring equipment NOW, so it will serve you tomorrow. Koehring distributors have genuine Koehring parts. Koehring parts warehouses are at your service.
KOEHRING
HEAVY DUTY
HEAVY-DUTY CONSTRUCTION EQUIPMENT

KEEP A STRAIGHT FACE

Keep your quarry floors level...speed up the loading cycle of your shovels; increase your quarry production by removing the toe. This can be done quickly and economically with the Ingersoll-Rand FM-2 Wagon Drill.

The flexibility of this lightweight, 3-wheel mounting permits its use on all kinds of terrain. Holes can be drilled quickly at any angle—wherever you want them.

Long drill steels can be handled easily. Set-up time is reduced and the time spent in changing steels can be cut in half; hence more footage is drilled in a shift.

The X-71WD Drill used on the FM-2 has been developed especially for wagon drill service. Here's a machine that will withstand a terrific amount of punishment. Its piston has a long stroke and hits a heavy hammer blow—a blow which has unique follow-through characteristics that are so essential for deep-hole drilling. In addition, the drill has powerful rotation and will blow deep holes easily.

The combination of FM-2 flexibility and X-71WD drilling power will help you increase your quarry production. Try Jackbits too. They will speed up your drilling still more.

KEEP 'EM DRILLING

Ask your supplier for an oil that meets I-R Specification 433—the new rock drill lubricant developed by Ingersoll-Rand.

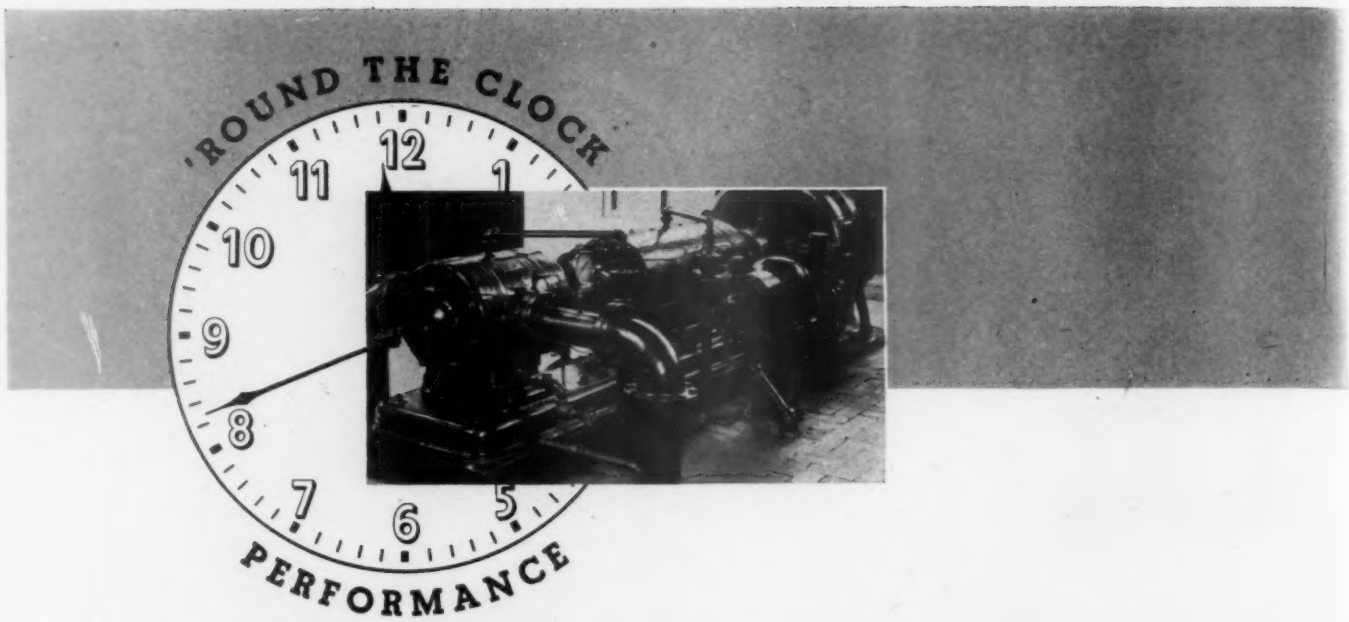
SOLVE YOUR DRILLING PROBLEMS WITH JACKBITS

Ingersoll-Rand

11 BROADWAY, NEW YORK 4, N. Y.

5-368

COMPRESSORS • TURBO BLOWERS • ROCK DRILLS • AIR TOOLS • OIL AND GAS ENGINES • CONDENSERS • CENTRIFUGAL PUMPS



Fuller Rotaries Give it to You

FACTS THAT PROVE THEIR WORTH . . .

A plant engineer in a war industry writes: "It is now approaching the third year of continuous operation for your two-stage compressor, (1800 C.F.M., 100-lb. pressure) during which time we are glad to report that the service load factor has been in the neighborhood of 99.9 per cent."

Another—"Your two-stage compressor, (100 C.F.M., 90-lb. pressure) has run 23 hours per day almost continuously for four years and has given no trouble." Not a cent was spent for repairs during these four years.

In a foundry—During three years' operation only $3.90 was spent for repairs on a two-stage compressor. (330 C.F.M., 100-lb. pressure).

Performance such as this warrants your careful consideration . . . lost time can never be recovered. Install Fullers for day in and day out service. Get acquainted with Fuller Rotaries . . . send in the coupon below.

SEND FOR THIS BULLETIN

FULLER COMPANY
Catasauqua, Pa.

Please send Bulletin C-5, describing Fuller Rotary Compressors and Vacuum Pumps.

Name..... Title.....

Company.....

Address.....

City..... State.....

C-92

FULLER COMPANY-CATASAUQUA, PA.

CHICAGO, 3
Marquette Bldg.

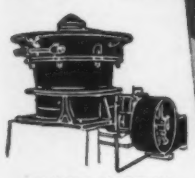
WASHINGTON, 5, D. C.
Colorado Bldg.

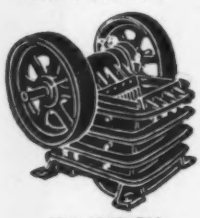
SAN FRANCISCO, 4
Chancery Bldg.

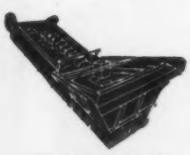
Ships with Bases
ARE THE SHIPS THAT COUNT

BELT AND BUCKET ELEVATORS

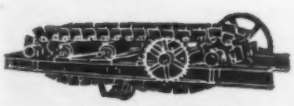
GYRASPHERE CRUSHERS


PRIMARY BREAKERS


JAW CRUSHERS


SAND CLASSIFIERS

PULSATORS


HEAVY DUTY FEEDERS

As a noted naval authority aptly put it, *ships with bases are the ships that count*—on the surface, under the surface, or in the air. All facilities at these overseas bases—airplane landing fields and runways, fuel depots, roads, docks, warehouses, gun emplacements, fortifications are built by the Seabees—the Construction Battalion of the Navy. And Telsmith aggregate-producing equipment is helping them do a real job.

Seabees are experienced pit and quarry men, road builders, earth moving and construction machinery operators. Navy training makes them a real fighting outfit as well as a first class construction unit.

Telsmith equipment is "experienced" too —its dependability proved over and over by civilian contractors. Today, Telsmith equipment and the Seabees are "shipmates" in the Navy. Bulletin E-15 tells the Telsmith story.

CBE-4

TELSMITH *Equipment*
FOR SAND, GRAVEL, ROCK CRUSHING PLANTS

SMITH ENGINEERING WORKS, 504 E. CAPITOL DRIVE, MILWAUKEE 12, WISCONSIN

Cable Addresses: Sengworks, Milwaukee—Concrete, London

Room 1604—50 East 42nd St. New York 17, N. Y.
211 W. Wacker Drive Chicago 6, Ill.
713 Commercial Trust Bldg. Philadelphia 2, Pa.
19-21 Charles St. Cambridge 41, Mass.
G. F. Seeley & Co. Toronto, Ont.
Mines Eng. & Equip. Co. San Francisco 4—Los Angeles 14
Brandeis M. & S. Co. Louisville 8, Ky.
Charleston Tractor & Eqpt. Corp. Charleston 22, W. Va.
Roanoke Trac. & Eqpt. Co. Roanoke 7, Va.
Clift L. Priester 911 S. 3rd St., Memphis, Tenn.
Wilson-Weesner-Wilkinson Co. Knoxville 8 and Nashville 6, Tenn.

OPERATE for PROFIT WITH THE..

YORK-KUNTZ AUTOMATIC VERTICAL LIME KILN

Here's an automatic Lime Kiln that not only eliminates crushing, thereby cutting your overall investment, but also gives you continuous control . . . resulting in a uniform burn that reaches the absolute peak of lime-fuel efficiency known to the industry. What's more, with York-Kuntz you get this automatic operation in a plant taking up less ground space and needing the attendance of only one operator per shift. Provided for either mixed feed, gas or coal firing, York-Kuntz Vertical kilns are the answer to the operator who seeks to increase quality and saleability of his product as well as conserve precious manpower. Added mechanical York-Kuntz advantages are: Continuous Discharge . . . Continuous Feed . . . Adjustable Distribution . . . Center Load Support . . . Center Combustion Control. . . . Write for complete description today.

Eliminates Crusher Plant

AND THE..

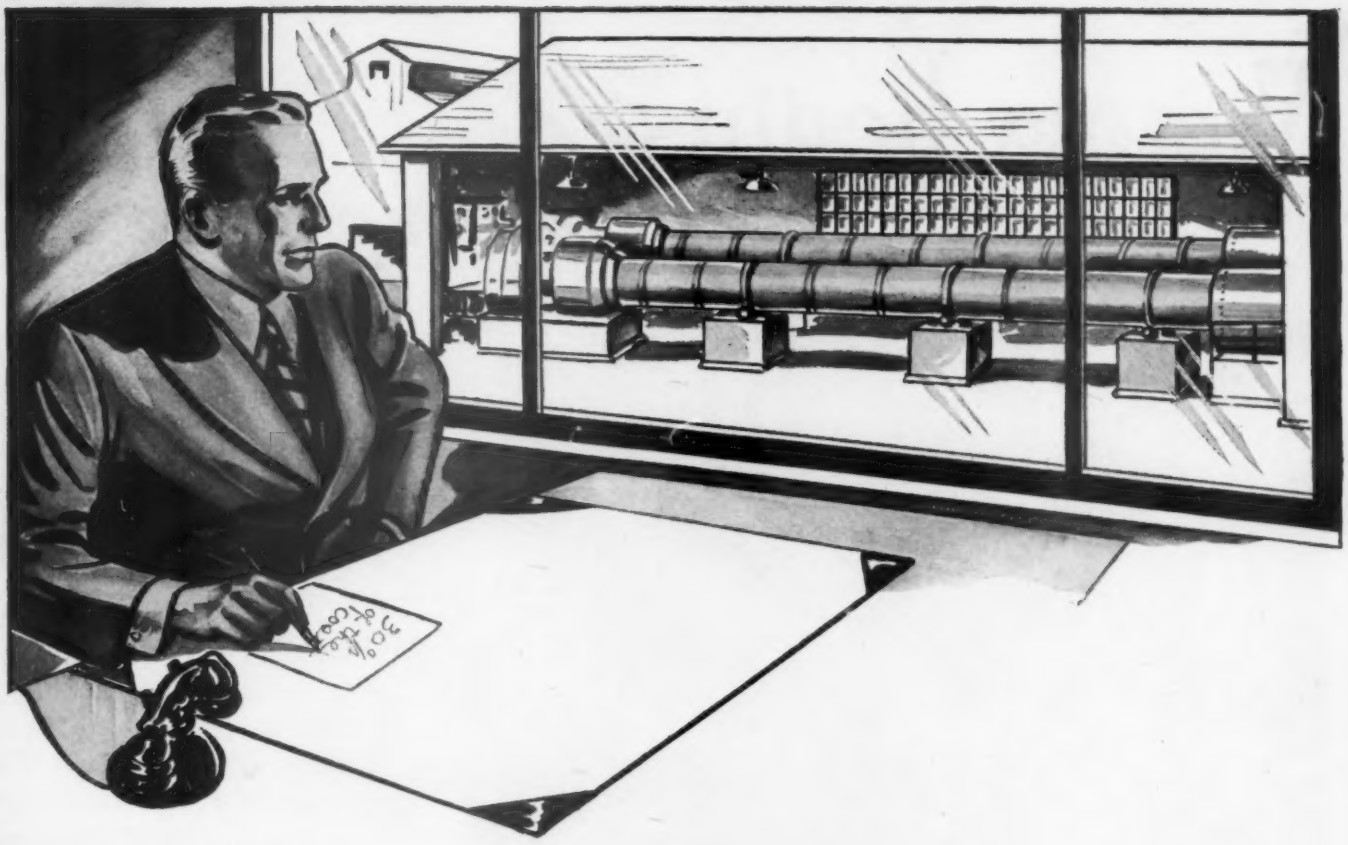
KUNTZ GRAVITY SYSTEM OF LIME HYDRATION

Absolute control of the hydration process within one unit . . . less floor space . . . lower first cost . . . that's operation for profit. You save as much as $1.50 per ton because patented dust control stops all loss of lime fines. You can meet more exacting market specifications . . . even in limes having as high as 10% impurities. Elements other than CaO or MgO are removed immediately by a patented dam and sump collection unit. Hydration heat, usually wasted, is used to heat water applied to the hydrator. These are a few exclusive Kuntz method features. Kuntz remains today the *only automatic system of one-man operation giving 100% control of quality and uniformity.* Batch or continuous method: can be applied to any type of hydrate plant. Write for complete information today.

Automatic Batch or Continuous Operation

LIME & HYDRATE PLANTS CO.

Associate **McGANN MANUFACTURING COMPANY, INC.** York, Pa.



Cut Cement Making Costs at the Water Line

HAVE you checked up lately on the very worthwhile reductions in fuel our American Disc Type Continuous Filters have brought about for many companies?

Fuel accounts for about 30% of the cost of making cement by the wet process. Therefore, any substantial reduction in fuel can be translated into attractive dollars and cents savings. Further, with actual and potential shortages of fuel, any saving is just so much added insurance against a forced curtailment in production.

While fuel savings alone justify the investment in the American Disc Type Continuous Filter, there are other operating advantages stemming from the feeding of drier slurry to the kilns.

An Oliver United engineer, experienced in slurry dewatering, will be glad to call and go over the latest methods and filter types with you.

Write or call our nearest office.

OLIVER UNITED FILTERS INC.

New York 18, N. Y.
33 West 42nd Street

San Francisco 11,
California

Western Sales Division
Oakland 1, Calif.
2900 Glascock Street

Chicago 1, Illinois
221 N. LaSalle Street

Victory begins *Underground*

YES, the underground of which you are a part, Igor and Petrov, has played a vital part in disrupting the plans of the Nazi Supermen in Occupied Russia.

The Red Army, strengthened by American-made tanks, guns and planes, is slowly crushing the ruthless invader back . . . back past the Dnieper River Valley where you were once free men. Other Allied Nations are crowding your captors from the East, South and West.

Over here skilled men are engaged in another underground activity—that of blasting out the coal and ore and stone that go to make up the fighting equipment of the Allied Nations. We make the Ensign-Bickford Safety Fuse and Primacord-Bickford Detonating Fuse *so essential to essential blasting.*

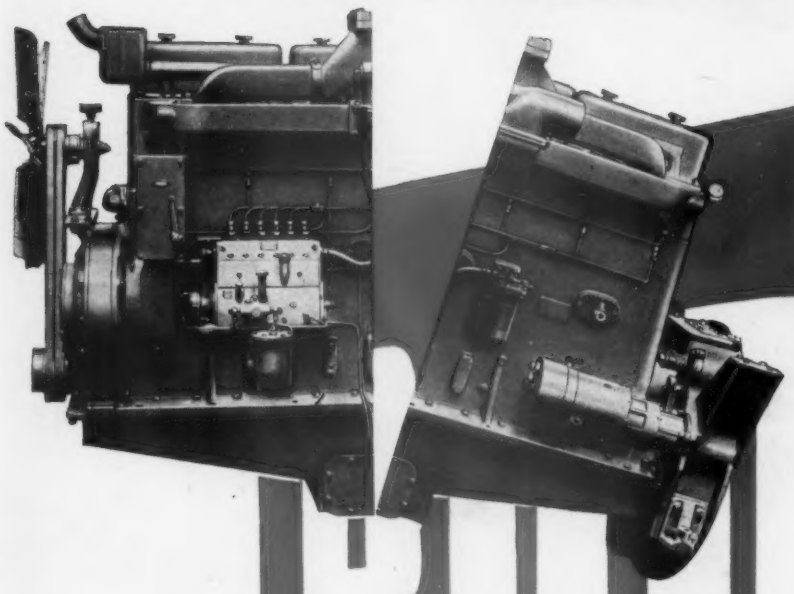
Victory Begins Underground.

L-P

THE ENSIGN-BICKFORD CO.
SIMSBURY, CONNECTICUT

Primacord-Bickford
Detonating Fuse

NEGLECT CUT THE LIFE of this engine in half...



BUDA

...ARE YOU TAKING CARE OF YOURS?

THE many years of useful service built into your Buda engine are the result of painstaking care in design, selection of materials and skilled workmanship. Give your engine the same care in lubrication and regular maintenance, and you'll get every hour of smooth performance out of it. Start regular engine maintenance now . . . keep your engine on the job for Victory! Your Buda distributor will gladly help you — see him today.

the BUDA Co.

HARVEY (Chicago Suburb) ILLINOIS

Get in the Scrap

. . . don't make it!

Every engine part you save means one more for the battlefront. Take care of your engine *regularly*—check your instruction book for details on lubrication and service.

ORDINARY DIESELS

. . . High cylinder pressures produce sledge-hammer blows that punish pistons, rods and crankshaft every power stroke.

BUDA
Low-Pressure DIESELS

Prolonged "Low-pressure" combustion delivers a smooth, steady power stroke that cuts vibration saves parts.

TO BUILD A HIGHWAY AND BUILD IT FAST! . .

Put a LINK-BELT SPEEDER on the job!

These mobile, powerful machines are turning in outstanding records for performance wherever they are in operation. Virtually maintenance-free, they can be kept at their job without needless delays for repairs. Finger-tip control permits easy operation and eliminates fatigue on the part of the operator. Designed and engineered for rugged performance under any and all conditions, Link-Belt Speeder is pointing the post-war way to efficient road building operation.

9363

LINK-BELT SPEEDER

BUILDERS OF THE MOST COMPLETE LINE OF
SHOVELS—
CRANES—
DRAGLINES

LINK-BELT SPEEDER CORPORATION, 301 W. PERSHING ROAD, CHICAGO, ILL.
(A DIVISION OF LINK-BELT COMPANY)

The women

They know that this is war, and that the price of victory will be high. They have sent off their sons, brothers and husbands to the armed forces, and they are coming out of beauty shops and offices, stores and homes, and are taking war jobs in steel mills and shipyards. The deft hands that in peacetime wielded the skillet and the dryer are now managing the boring mill and the welding torch—and to very good effect.

Ever try keeping traffic flowing smoothly in and out of the main entrance of a big steel plant? Ever knock a "hot top" off an ingot? Or rough-bore a gun forging? Or weld a ship's hull? Not women's work? Women are every day doing these and dozens of other jobs in Bethlehem shipyards and steel plants, and doing them superbly.

At Bethlehem and Lackawanna, at Baltimore, at Fore River and Hingham, on the Pacific Coast—and at other locations where this company operates plants and shipyards—former clerks and beauty-shop operators, salesgirls and housewives, are applying themselves to their new, challenging tasks with wonderful spirit and skill. They are helping to swell the mighty output of steel and ships and ordnance. The results of their efforts are being painfully felt in Tokyo and Berlin. Hats off to them!

★ ★ ★ BETHLEHEM STEEL ★ ★ ★

Woman "patrolman" at a Bethlehem steel plant. Here is a job calling for plenty of tact and skill! Women are serving on patrol duty at gates, parking lots, offices, and other locations with efficiency and aplomb.

Once a dancer, now she runs a machine in a Bethlehem shipyard.

This "buggy" operator is hauling naval shells in a Bethlehem plant.

Upswept hairdo, red finger-nails, don't keep this girl welder from doing a man-size job at a Bethlehem shipyard.

The Navy knows the Answers

In our Navy, the world's most formidable fighting machine, Diesel-powered craft of all kinds are lubricated with Standard of California's RPM DELO. The answers in this naval quiz tell you why. They'll solve your problems on how to squeeze more efficiency out of your Diesels—and cut maintenance costs.

Q. Can a submarine drown in air?

A. Yes. Her Diesels "breathe in" great quantities of air which cause ordinary oils to turn gummy, stick rings and hasten engine failure. In today's subs, RPM DELO eliminates this ring-sticking, reduces sludge and deposits—greatly increases cruising range.

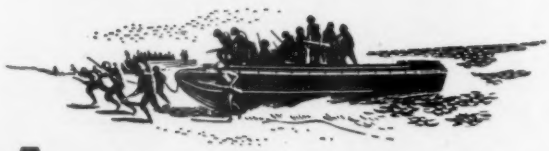
Q. How do you put a bone in the teeth of a DE?

A. Powerful Diesels put that speed wave under the bow of a Destroyer Escort. With RPM DELO lubricating her big engines and keeping them at top efficiency, a Destroyer Escort can sprint like a racehorse, even at the end of a long convoy trip.

Q. What is the most explosive part of a minesweeper?

A. Her engine. Thousands of times a minute, fierce explosions sear her cylinders. But they're safe with RPM DELO because it contains special additives that make it cling to hot spots, give constant point-of-wear protection, even under most severe conditions.

Q. What is the most important duty of a landing barge?



A. To keep in action—because a beachhead breakdown could be disastrous. RPM DELO in a landing boat's Diesel gives it extra protection against breakdowns. RPM DELO often cuts Diesel repair bills in half, doubles the time between overhauls, minimizes wear.

RPM DELO

RPM DELO is marketed under the following names: RPM DELO • Caltex RPM DELO
Kyso RPM DELO • Signal RPM DELO • Imperial-RPM DELO • Sohio RPM DELO
CONCENTRATE

STANDARD OIL COMPANY OF CALIFORNIA

Ask your Diesel engine manufacturer or distributor for the RPM DELO supplier in your vicinity

That the WHEELS OF WAR may ROLL FASTER!

THE IOWA LINE

of Material Handling Equipment Includes

ROCK AND GRAVEL CRUSHERS
BELT CONVEYORS — STEEL BINS
BUCKET ELEVATORS
VIBRATOR AND REVOLVING SCREENS
STRAIGHT LINE ROCK AND GRAVEL PLANTS
FEEDERS — TRAPS
PORTABLE PLACER MACHINES
PORTABLE POWER CONVEYORS
PORTABLE STONE PLANTS
PORTABLE GRAVEL PLANTS
REDUCTION CRUSHERS
BATCH TYPE ASPHALT PLANTS
TRAVELING (ROAD MIX) PLANTS
DRAG SCRAPER TANKS
WASHING PLANTS
TRACTOR-CRUSHER PLANTS
STEEL TRUCKS AND TRAILERS
KUBIT IMPACT BREAKERS

THEY DIDN'T GO "foot slog, slog, slog, slogging over Africa" when Rommel was on the run. The man with the trucks got there "first with the mostest!"

Trucks, planes — all wheeled equipment moves over roads — this is a modern mechanized war and to beat the enemies we have takes the best.

Wherever there is action you'll find a Cedarapids crushing plant pouring out aggregate that the wheels of war may roll faster.

But there is something more than that coming out of the wartime construction and operation of machinery. The performance of a crushing plant under the press of war service can teach valuable lessons for peacetime operation.

Cedarapids owners of the future are going to reap the benefits of the vast wartime experience that Iowa engineers are building up. They are going to reap the benefits of improved design, refinement, smoother operation, higher output and increased economy — benefits that could only come from the watching of a tremendous number of machines under pressure.

Iowa can meet your future plans, whether it is for crushers, bins, screens, asphalt plants, driers or portable or stationary equipment. Now is the time to familiarize yourself with Cedarapids equipment. Come to headquarters.

IOWA MANUFACTURING COMPANY, Cedar Rapids, Iowa

SPEED

— can be increased with a

PMCO

WELDED DIPPER

Shovel engineers solve the problem of increasing speed and daily output of power shovels by using fast moving PMCO Welded Dippers. Welded fabrication eliminates burdensome weight and under almost every condition a larger size PMCO Welded Dipper can be used without increasing the power or mechanical structural parts of the shovel.

We operate the largest and most complete manganese steel foundry in the United States.

PETTIBONE MULLIKEN CORPORATION

Established 1880

4710 West Division Street, Chicago 51, Illinois

St. Regis VALVE PACK SYSTEMS... *Available*

TO SAVE TIME — MANPOWER — MONEY

1 SAVE TIME. Preweighing and forcing cement at high speed through the valve opening, the St. Regis Packer under average operating conditions packs from 8 to 24 (94 lb.) Multiwall Bags per minute . . . saves from 30% to 50% in actual manhours.

2 SAVE MANPOWER. *Only one* operator is required on the St. Regis Packer even when it has 2 or 4 filling tubes. Since all lifting of bags is eliminated, the machine can be successfully operated by a woman where the manpower shortage is acute.

3 SAVE MONEY. Installed and operated at minimum expense and eliminating the need for any closing equipment, the St. Regis Valve Bag Packer assures lasting conomy.

4 The number of these machines available for immediate installation is limited. If interested please advise our nearest office.

MULTIPLY PROTECTION • MULTIPLY SALEABILITY

ST. REGIS PAPER COMPANY

TAGGART CORPORATION • THE VALVE BAG COMPANY

NEW YORK: 230 Park Avenue

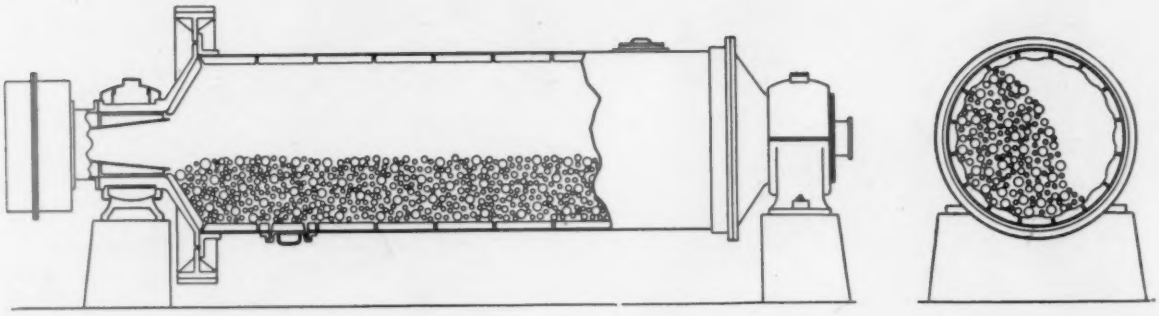
CHICAGO: 230 No. Michigan Avenue

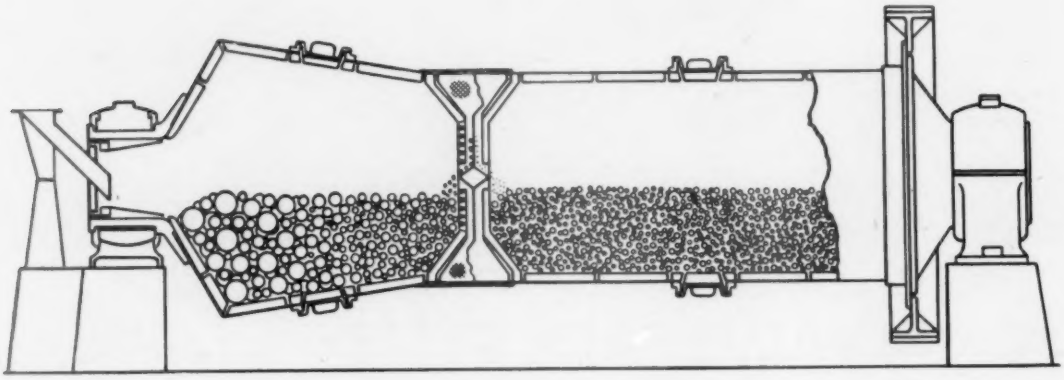
IN CANADA

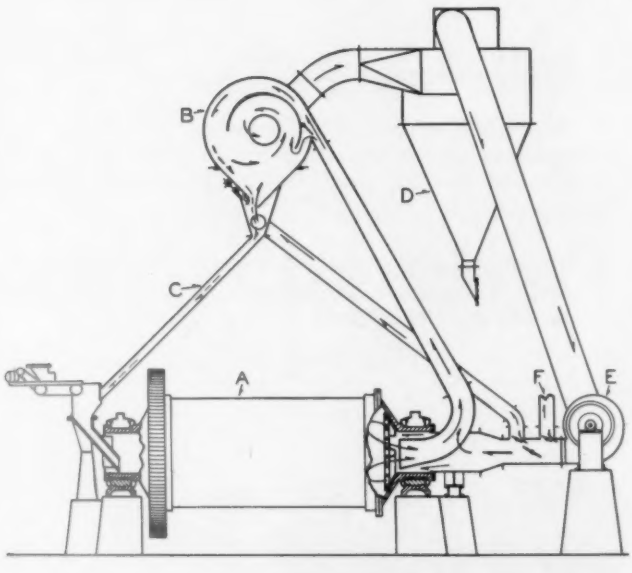
BATES VALVE BAG CO., LTD.
Montreal, Quebec
Vancouver, B. C.

Baltimore, Md. Birmingham, Ala. Dallas, Tex. Denver, Colo.
Los Angeles, Calif. New Orleans, La. Seattle, Wash.
Franklin, Va. Nazareth, Pa. San Francisco, Calif. Toledo, Ohio

New Hardinge Tube Mill Bulletin







Here are 3 of the 26 illustrations of Ball, Pebble and Compartment Mills found in this new bulletin.

Write for your copy of Bulletin 18-A.

HARDINGE

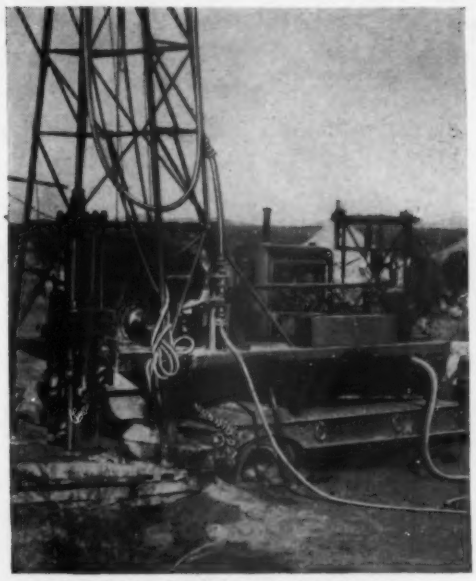
COMPANY, INCORPORATED - YORK, PENNSYLVANIA

122 East 42nd Street
New York, N. Y.

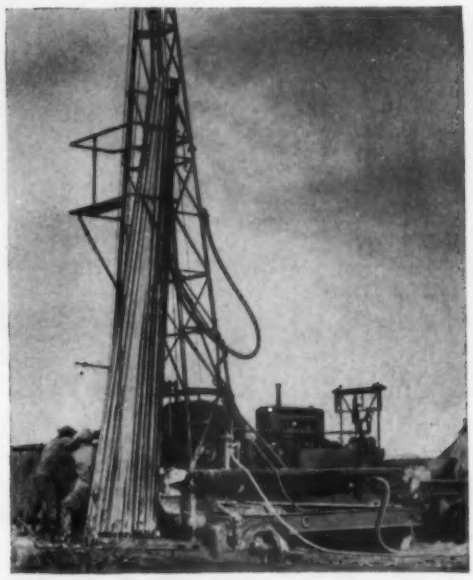
205 West Wacker Drive
Chicago, Illinois

501 Howard Street
San Francisco, California

200 Bay St.
Toronto, Ontario, Canada



THE HIGH-SPEED, PORTABLE DRILLING RIG is moved right up to the front lines by combat troops. The extremely flexible United States Rubber Company hose with which it is equipped is not only very strong but so much lighter weight than commercial hose made for similar purposes that there is a saving of several hundred pounds to be transported.



THE FIVE DISTINCT TYPES of United States Rubber Company hose supplied for the combat-zone drill rig are: high-pressure rotary hose; mud-suction hose, capable of being re-shaped if crushed; light, strong, wash-down water hose; high-pressure hose for hydraulic controls; oil suction hose for hydraulic system. These hose, as well as the special rubber valves, pistons and packings also supplied by the United States Rubber Company, are all specially designed to get water fast and to be tough for front line service.

"But You've Got To Drill For It!"

Thirsty work—plowing across blazing desert—slogging through murky jungle—crouching in the rubble of blasted towns.

Wherever they are, our soldiers get plenty of fresh water to drink. When it isn't in sight or when what's in sight may not be safe—you've got to drill for it, deep underground.

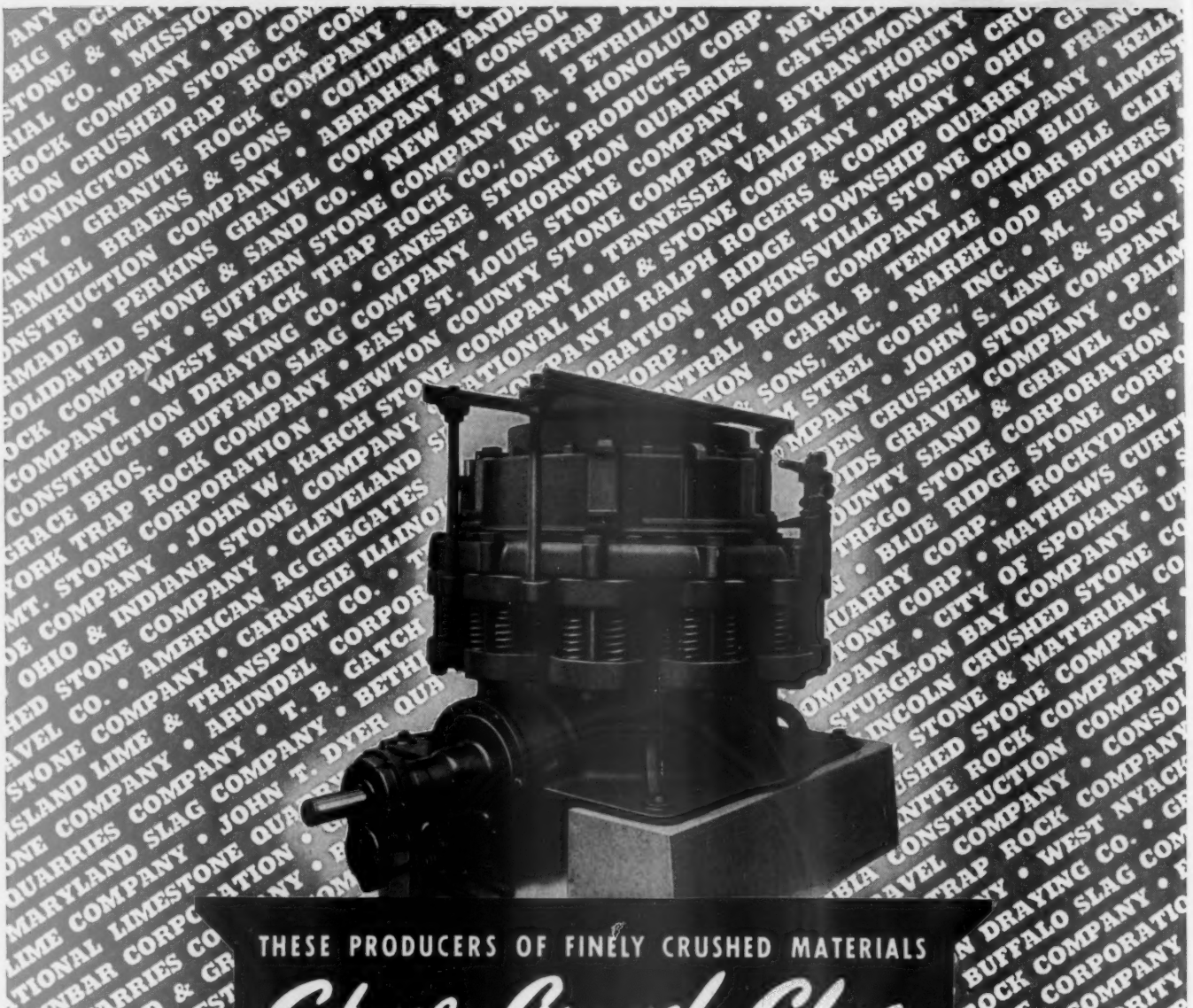
With the Army on the move, maintaining an ample water supply, sometimes under fire, means drilling fast, whipping away to another sector, drilling again. A tough problem in equipment, that! But it's been licked—rubber helped.

The George E. Failing Supply Company of Enid, Oklahoma, in conjunction with the U. S. Army Corps of Engineers, designed the needed high-speed, portable drilling rig. Working with them, United States Rubber Company provided various types of special hose—rugged enough for this rough, tough service but extra lightweight to keep pounds at a minimum.

United States Rubber Company engineers have aided many manufacturers in their problems of supplying articles of rubber for direct warfare use by the Armed Forces . . . as well as rubber equipment for plant production, safety and protection uses.

1230 Sixth Avenue • Rockefeller Center • New York 20, N. Y.

UNITED STATES RUBBER COMPANY



THESE PRODUCERS OF FINELY CRUSHED MATERIALS

Stone - Gravel - Slag

MAKE THEIR MINUS HALF INCH SIZES WITH

SYMONS SHORT HEAD CONE CRUSHERS

NORDBERG MACHINERY

NORDBERG MFG. CO. MILWAUKEE WISCONSIN

NEW YORK · LOS ANGELES · LONDON · TORONTO

PRINT IN

These Men Are *Revolutionizing* The Future Of Material Handling!

Marion Engineers, by designing the right type of material handling equipment, have contributed much to the Nation's amazing record of Victory ship construction. These same men are right now planning the type of equipment that contractors, open pit mine, industrial plant and quarry operators will need to solve postwar material handling problems. While appearance is being stressed in some quarters, Marion Engineers prefer to concentrate on lower operating costs and greater flexibility. These still remain common ground for sound engineering development.

THE MARION

STEAM SHOVEL CO. ★ MARION, OHIO

Shovels • Draglines
Clamshells • Cranes
Portal Cranes • Walkers

T IN BINDING

"THIS YEAR, LET'S PAY THE BONUS IN WAR BONDS

. . . and drive even harder on the pay-roll savings plan!"

Make War Bonds the Christmas Order of the Day. Urge your workers to make their personal Christmas gifts in the form of War Bonds—and practice what you preach! Make this a 100% War Bond Christmas—to insure future Yuletides of peace and prosperity.

Make up your own posters to spread the "War Bonds for Christmas" story across your plant. Tell the story again and again on bulletin boards, in your plant magazine, and on pay envelope stuffers.

But don't forget your basic, all-important Pay-Roll Savings Plan. How's it going, these days? Perhaps it needs a bit of stoking-up right this very minute, to hold its full head of steam against the competitive demands of the holiday season.

Well, you're the man to stoke it! You can't expect it to keep running indefinitely on last summer's enthusiasm. See to it that your participation percentages, and your deduction percentages, *both* end up the year at new levels.

Every month, now your Pay-Roll Savings ought to run well ahead of the preceding month. *For so many families that formerly depended on the earnings of a single worker, now enjoy the combined earnings of several.* Such *family* incomes are doubled, trebled, even multiplied many times.

Now's the time to turn as much as possible of these increased earnings into War Bonds—War Bonds for Christmas . . . and War Bonds the whole year 'round!

GIVE THE PRESENT WITH A FUTURE—WAR BONDS!

This space contributed to Victory by PIT AND QUARRY

This advertisement prepared under the auspices of the United States Treasury Department and the War Advertising Council

STRIPPING, ROAD BUILDING, CLEANING-UP IS HANDLED IN A HURRY WITH *2-CYCLE DIESEL POWER*

The day this Allis-Chalmers, 2-Cycle Diesel tractor and scraper "go at it" on your operation . . . the dirt will really start to move. Whether the job is rebuilding that bad section of road . . . stripping, excavating, or other similar work . . . you will marvel at the power and speed of this outfit. There's less tugging to load . . . less gear shifting. Smooth 2-Cycle Power hangs on with steamlike tenacity. You get heaping loads in record time . . . rear-dump them wherever you desire — on the level, over a slope, or other ordinarily hard-to-get-at places. Makes short work of tough jobs. Saves you plenty, too. Fewer repairs are necessary. Operates on ordinary Diesel fuels. Add a bulldozer, and you can work both ends . . . multiply its usefulness . . . subtract from your cost. Rates high with experienced operators.

If you qualify under government regulations, you can put this fast-moving, money-saving Diesel to work now. Fifteen per cent of our crawler tractor production is released for essential civilian use. See your Allis-Chalmers dealer now about the availability of equipment for your needs.

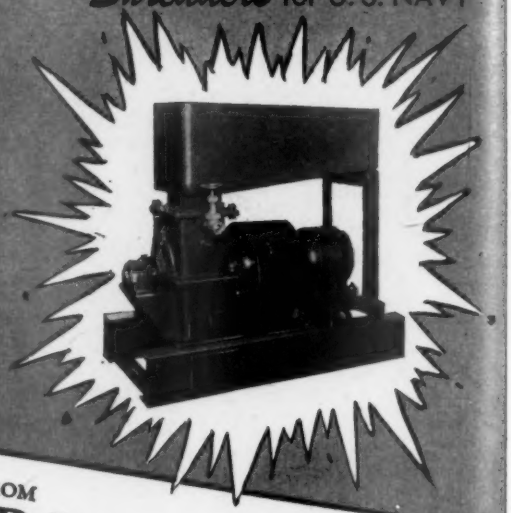
The above HD-7, 2-Cycle Diesel, with a Gar Wood, 2-wheel scraper and 'dozer, gets quick results for owner Leonard I. Trineman, Hector, Minnesota — shown building truck roads around his crusher.

ALLIS-CHALMERS
TRACTOR DIVISION · MILWAUKEE · U. S. A.

2-Cycle THE MODERN DIESEL POWER

Now it can be told!

Garbage and Refuse Shredders for U. S. NAVY



On Battle Ships—in Far Distant Islands—in the African Campaign—in Alaska—GRUENDLER Equipment in the War as in peace time, is doing an important job, a big job. New developments in Equipment Efficiency have been made and will be announced Post War.

LET US ALL WORK FOR VICTORY NOW

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TO THE MEN AND WOMEN OF GRUENDLER CRUSHER AND PULVERIZER CO=

:A US AIRCRAFT CARRIER, WHICH HAS STEAMED OVER 111,000 MILES ON VITAL MISSIONS DURING THE PAST TWO YEARS, REPORTS THAT YOUR GARBAGE GRINDER, CRUSHER AND PULVERIZER FUNCTIONED EFFICIENTLY AT ALL TIMS. THE SAFETY AS WELL AS THE CLEANLINESS OF A SHIP DEPENDS IN NO SMALL MEASURE ON THE PROPER DISPOSAL OF GARBAGE YOUR EQUIPMENT, IN DISPOSING OF GARBAGE WITHOUT A TRACE, IS VITAL TO OUR SHIPS OPERATING IN SUB-INFESTED WATERS=

E L COCHRANE REAR ADMIRAL USN CHIEF OF THE BUREAU OF SHIPS. 1152A.

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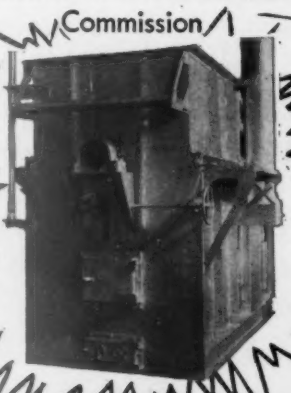
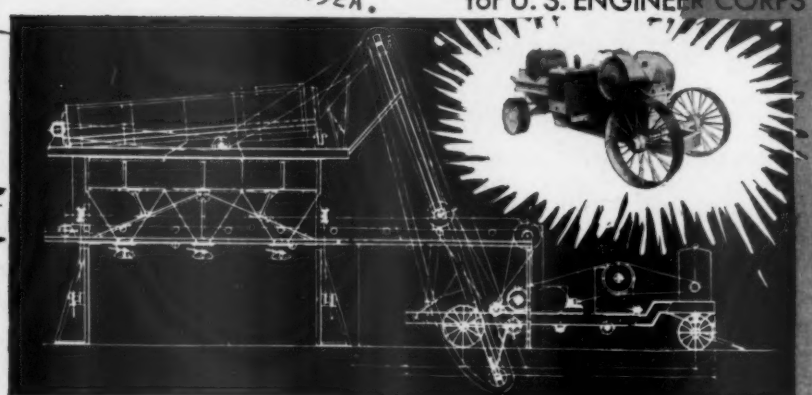


Portable Crushers for U. S. ENGINEER CORPS



Portable Crushing Plants for "Sea-Bees"—U. S. Bureau of Ships and Docks

BUY WAR BONDS

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CRUSHER & PULVERIZER COMPANY

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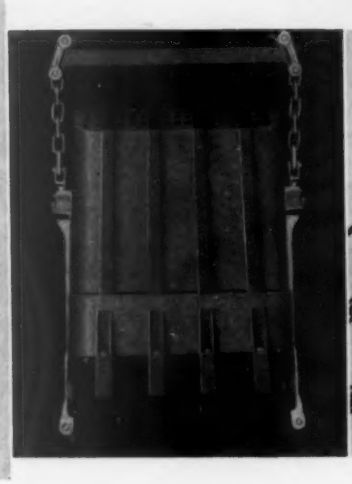
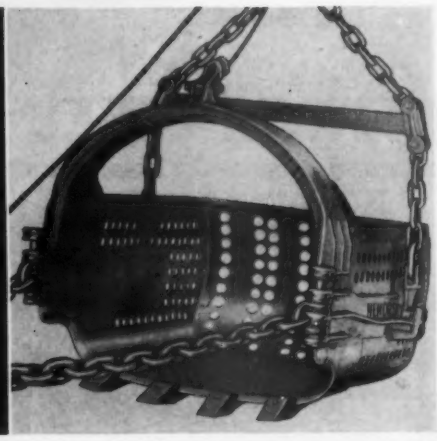
ALL-WELDED CONSTRUCTION

for greater strength and durability

When the HENDRIX Lightweight was conceived, its designer incorporated many outstanding features not found in other dragline buckets. And in their zeal to create the finest product possible, our engineers specified all-welded construction as a worthy companion to the other advantages. Bucket weight is thus saved and greater strength, durability and toughness built in. Manganese steel reversible tooth points, chains and fittings are standard equipment on all buckets in the line.

MANGANESE STEEL
Chains and Fittings
Standard Equipment on all Buckets





The perforations, for which the Lightweight has become famous, are made round and so arranged that the overall strength of the bucket is unimpaired. This decreases the hazard of side-wall cracks. Heavy reinforcing ribs on the bottom and on the curved back are added to give additional assurance of long and efficient trouble-free service. With all excess weight eliminated, the result is a weight advantage over other buckets of from 20% to 40%. This permits the use of large capacity Hendrix Buckets on small machines and on long booms. We'd like to tell you more. Write for descriptive literature . . . or ask your dealer.

Available in three types
Light, Medium and Heavy Duty
⅜ to 20 cubic yards

Also available *without* perforations.

★ ★ ★

YOUR SCRAP MAY SAVE A LIFE!
GET IT INTO THE FIGHT!

HENDRIX *Lightweight* **DRAGLINE BUCKETS**

DESOTO FOUNDRY, INC. ★ MANSFIELD, LOUISIANA

It's the Ottawa "Jay Hawk" Hydraulic Front End Loader for Economy and Speed in Moving Bulk Materials

Made for International Tractors, Models W-4, I-4, I-6, ID-6 and FARMALLS "H" and "M".

Built up to a Standard

Handling earth, sand, gravel, coal and similar materials is "right up your *profit* alley" if you're equipped with this versatile loading unit. Just consider the all 'round utility features centered in the "JAY-HAWK" Loader with ½-yd. bucket:

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- Fast operation — average two loads per minute
- Complete finger tip control
- Loader easily attached or removed without altering tractor
- Bucket automatically stops in highest position
- Low ceiling operation provides *clear vision for driver*

Write for Full Details

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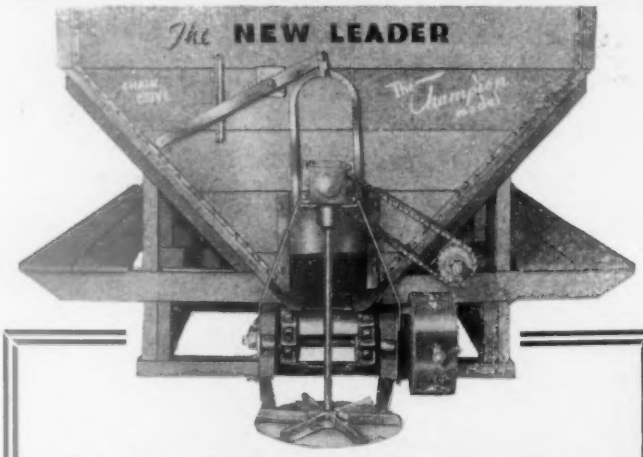

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Can Now Be Purchased Without Triple AAA Certificates or Priority

New • Improved • Heavier in Construction and Reinforcement • Built to Stand Hard Usage • Heavier Shaftings, Bolts, etc.

NEW LEADER Lime Spreaders can now be purchased with extra heavy duty pintle type conveyor chain. Positive-feed, self-unloading spreader will spread wet or dry lime uniformly from 30 to 45 feet in width.

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Manufacturers of the World's Most Complete Line of Spreaders, Including Lime Spreaders, Sand and Cinder Spreaders, Chip Rock, Clay and Dirt Spreaders.

CEDAR RAPIDS, IOWA, U. S. A. Phone 32017-32018

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American Synthetic

—is actually better than natural rubber

Synthetics, developed by American chemists, can be blended in various ways to suit various requirements. We'll use one type of AR-POLENE for a certain belting . . . another type for a certain hose. As a result, industrial rubber products of this company are actually improved in quality. What's more, the shortage is becoming less acute day by day.

Conveyor Belts

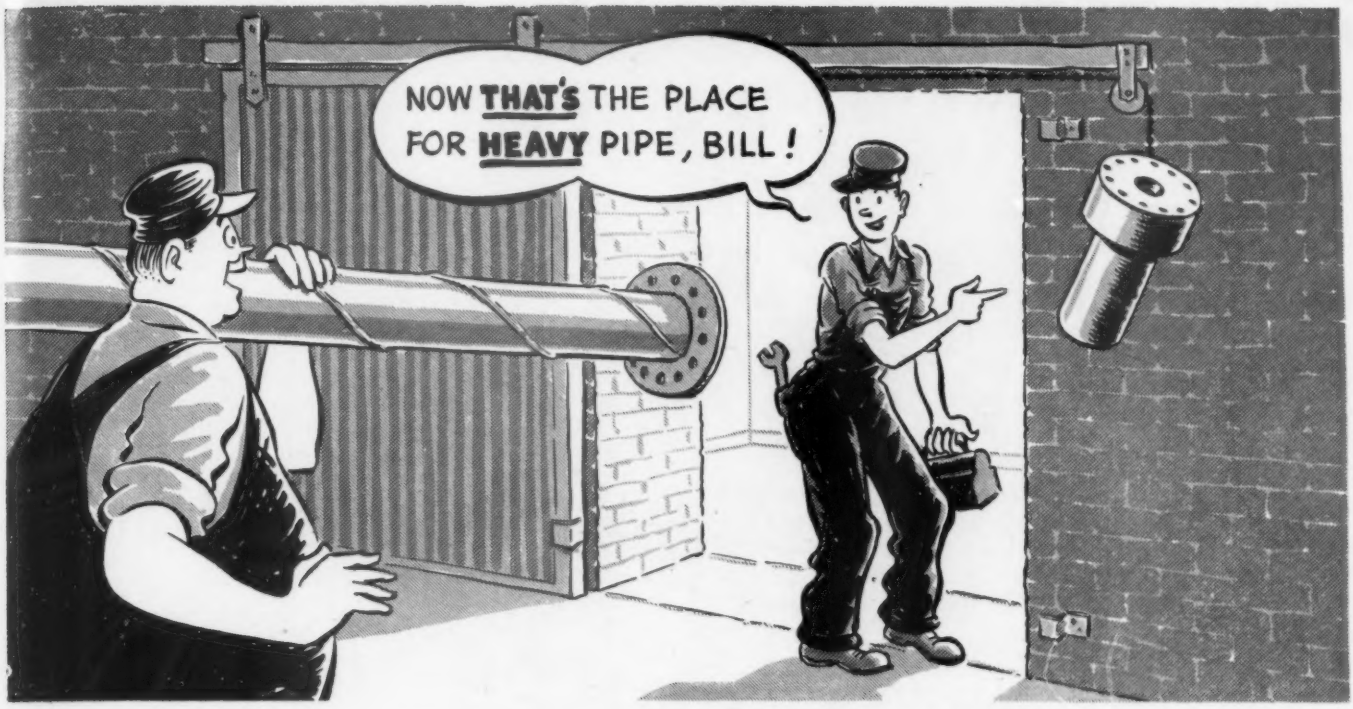
Illustrated is a section of a conveyor belt with raised center cover—thicker where the load is carried. Learn, too, about the special advantages of the Lightning Ribbed Conveyor Belt with which the load can't slip regardless of water.

The

AMERICAN RUBBER Manufacturing Co.

Factory and General Offices:

Park Avenue and Watts Street, Oakland 8, California



Yes, there are lots of places for heavy pipe —but a lot more for Taylor Spiral

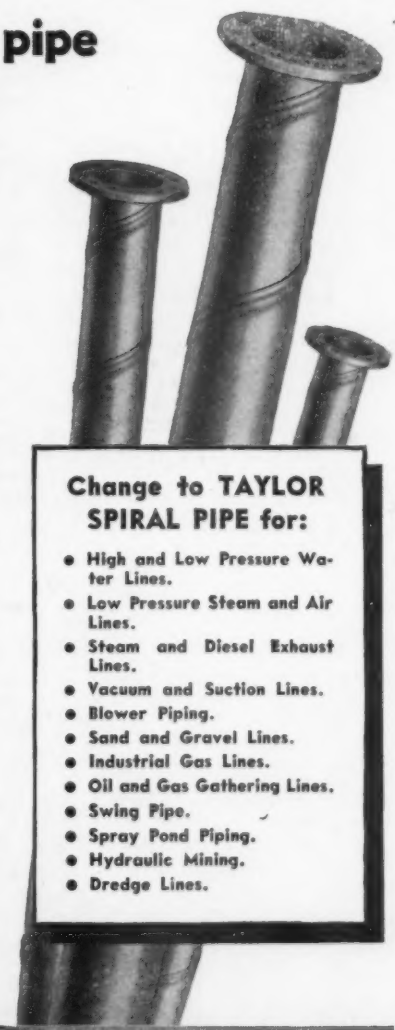
UNDERSTAND that we have no fight with heavy pipe. Fact is, we lean over backwards in the matter of pipe thickness and strength whenever extreme service conditions are present.

But just now we are talking about the ordinary run of services like those listed below. In most plants—possibly in yours—Standard Thickness Pipe is largely used for services of this class. Yet if you stop to figure clear through you will find that Standard Thickness is much heavier than is actually needed for these low or moderate pressure needs.

Those who have gone into this matter have found that light-but-strong Taylor Spiral Pipe can take over a large percentage of the jobs customarily assigned to Standard Thickness Pipe. Its spiral seam gives it greater strength in every direction than any other type of pipe of equal wall thickness—enables it to handle these services adequately, with strength and service life to spare.

In many applications the lighter weight of Taylor Spiral cuts installed cost to half that of the heavy pipe it replaces. In these times that means a lot: Not only saving of dollars; also conservation of vital steel.

Changing to Taylor Spiral Pipe for services like those listed is made easy by the complete range of sizes and fittings. Thicknesses range from 18 to 6 gauge; sizes from 4" to 42"; joint lengths up to 40 ft. All types of end joints and couplings, all kinds of fittings and specials or fabricated assemblies, are produced by Taylor Forge, assuring a complete service and undivided responsibility.



Change to TAYLOR SPIRAL PIPE for:

- High and Low Pressure Water Lines.
- Low Pressure Steam and Air Lines.
- Steam and Diesel Exhaust Lines.
- Vacuum and Suction Lines.
- Blower Piping.
- Sand and Gravel Lines.
- Industrial Gas Lines.
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TAYLOR *Spiral* PIPE

PIT AND QUARRY

Vol. 36 DECEMBER, 1943 No. 6

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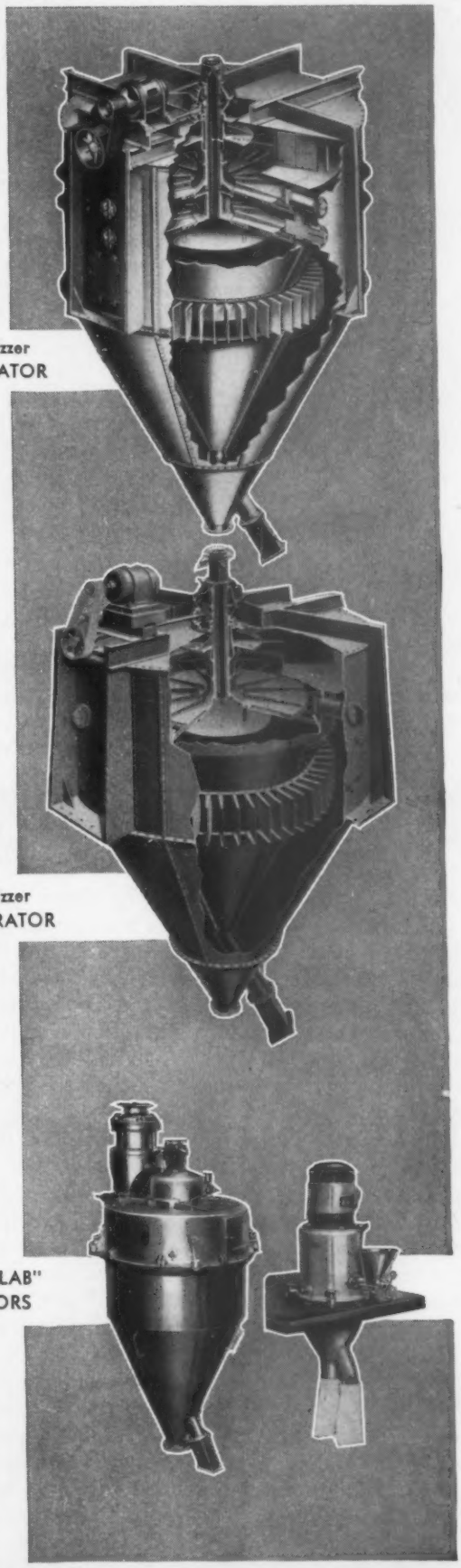
Boost Your '44 Mill Grinding Capacity



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AIR SEPARATOR

Single Whizzer
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SEPARATORS

with the Whizzer Type

RAYMOND

MECHANICAL AIR SEPARATORS

This *modern design classifier* with the patented whizzer feature gives the extra efficiency you need for increasing production of today's high-specification materials. In closed circuit operations, it advances mill output from 25% to 75% or more.

BETTER PRODUCTS

The action of the revolving whizzer blades insures closer control of particle size with sharper selection of fines, cleaner tailings and more uniform finished materials.

EASIER CONTROL

Fineness can be regulated within wide limits by vertical slide dampers. In separating cement, for example, you can produce standard grades or high-early strength cements by the slide adjustments alone.

LOWER COSTS

For classifying gypsum, limestone, clays, graphite, slate dust, talc, silica, chemicals and manufactured products, you can obtain either the commercial grades or superfine materials with maximum economy when using the Raymond Separator.

RANGE OF SIZES: Built in eight sizes from 4 feet to 18 feet diameter; and also 30-inch unit and 10-inch Laboratory Separator.

Write for Raymond Separator Catalog No. 45 . . . also Laboratory Bulletin No. 53.

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COMBUSTION ENGINEERING COMPANY, INC.
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EDITORIAL

The Four Freedoms at Home

MORE than two years have elapsed since the Atlantic Charter was drafted and in the months that have passed large numbers of people have doubtless come to the belief that the pronouncement of the "four freedoms" represents the aims, indeed the longing, or large parts of the human race. To Americans they seem to be but a clarification of the principles of human liberty which the Declaration of Independence, the Constitution and the so-called "Bill of Rights" have set up for the people in this country. We have often, as individuals and as a nation, proclaimed to the world our belief in these fundamental rules affecting human relations, and even when we have not been vocal about these priceless rights, we have felt them deeply and guarded them zealously. To the peoples of many other nations, and particularly those in which liberty has been all but destroyed, the Atlantic Charter carries the promise of a better future, a greater respect for the rights of others, a greater spirit of toleration, a fuller understanding of the community of interest between all peoples, than has been evident in the past. Even the skepticism that suggests that they may not be fully realized has not been enough to chill the hopes of those, here as well as abroad, who have believed that the present period may witness the real beginning of the practice of human brotherhood.

Despite the satisfaction with which the unfolding of this spirit may properly be regarded, there is cause for concern about the extent to which we in America give practical expression to those principles in our relations with one another. After pondering over what one hears in the ordinary conversations of day-to-day living, one may not without reason wonder whether we in our atmosphere of freedom are really convinced of the fundamental validity of the principles we so often, and perhaps too lightly, proclaim. It has often been said that those of us who were born in America place too little value on the privileges that are ours, that those of us who elected to live in America in preference to their native lands think more highly of these rights which are new to them but so old to others. Opportunities and privileges newly acquired are almost certain to be more highly regarded than those which have lost much of their initial appeal through habitual association. A regeneration of faith in the principles on which the government of this country was established would not be amiss among some of those who would be the first to show offense if their appreciation of, or belief in, those principles were questioned.

Equality of opportunity is one of the principles to which many people are ready to give their endorsement; but with too many of them it is to be applied not too strictly nor too broadly. They are not prepared to concede, in theory or in practice, its applicability to others than themselves; to them, if we may judge their beliefs by their performance, it is a sort of unilateral right, possessed by the claimant when it serves him but not possessed by others if their exercise of it should in any way threaten him or his interest. They would narrow its applicability to fit the pattern of self-interest. And while equality of opportunity may, they say, be beyond question in such matters as the right to speak or write openly, it is not to be applied to the right to live or work where one chooses. Everyone may have access to the air we breathe on equal terms, but not to economic opportunity within our community life.

In the Atlantic Charter the right to dwell in safety is particularly mentioned as one of the objectives of the peace and it deserves such specific naming among the aims of civilized peoples. Are we prepared to insist upon the protection of that right for every one of us here without regard to nationality, creed or race? The events of recent months would seem to show that to some of us this, like other forms of freedom, should not be applied indiscriminately but in accordance with prejudices that spring from ignorance and habit.

Freedom from fear stands at the top of the list in any enumeration of the rights which human beings should share, for it covers fear of persecution, fear of physical violence, fear of economic want. By proclamation we have declared ourselves as in favor of removing this fear from the lives of all men. Yet there are those among us who would, in this case too, like to see this type of freedom reserved for themselves alone and denied to those of whom they may, for social, political, racial, or economic reasons, disapprove.

UNLESS there is freedom for every one there will be freedom for no one, because freedom is something that can not be confined or parceled out, given to some and withheld from others, for then it ceases to be freedom and becomes special privilege. As a nation we can not be free until freedom is universally admitted to be the right of all men within it and not the special privilege of certain groups, which, because of the pressure they can exert, demand and receive concessions that can be granted only by the damage or destruction of other men's rights. Nor can humanity be free until certain nations relinquish their claims to special rights and make them available to all.

This war and the peace that will follow it will do much to educate men in the realities of their relations with and obligations toward one another, and that will be one of the truly great results of the conflict. It is a form of education to be sure, yet the most costly that could be devised. We at home have the opportunity to educate ourselves in the truths of life and discard the prejudices that arise from habitually distorted thinking about our fellowmen here and abroad. Underneath most of these prejudices can be found gross ignorance of biological and psychological facts, a knowledge of which our much overpraised system of formal education apparently has failed to give us. Fortunately it is a form of education that is open to us all because it can be self-acquired and at the nominal cost of desire and effort. Surely that is a trifling price to pay for knowledge that can truly liberate mankind.

No other V belt like this

The first and only grommet-type wire reinforcement—a B. F. Goodrich development

THIS new belt, reinforced with endless wire grommets, transmits more horsepower for a given size of belt. It will solve problems created by difficult old applications and will be useful in many new ones.

Ordinary wire V belts are made by winding a continuous wire around a drum, then cutting into narrow sections to form the individual belts. Thus in ordinary belts there is a point on each side where the wire is close to the edge. The B. F. Goodrich grommet is made by forming wire cable into a loop, then winding it spirally on itself up to the needed size. It's endless; in the belt it is always the same distance from the edge (wires will never be exposed by slight wear); it has less stretch than small individual cables, more strength for a given amount of wire. Thus it transmits more horsepower for a belt of given size.

The wire grommet, spirally wound in one direction, is covered by cord spirally wound in the other direction. Thus each grommet is balanced — and each belt is balanced.

Strongest V belt ever made

This new principle makes the strongest V belt ever produced in proportion to size and weight. The well-known V belt advantages of efficient power transmission, low maintenance, long trouble-free life, quiet and clean drives, less weight are now available for many drives which have always had to put up with heavier, costlier methods.

If you have drives on which other belts have failed — or drives on which lack of strength has made former V belts impractical — write B. F. Goodrich. Our belt specialists will help you engineer this revolutionary new belt to your drives to give you greater power efficiency, and save you money, trouble and production time. *The B. F. Goodrich Co., Industrial Products Division, Akron, Ohio.*

B.F. Goodrich

RUBBER *and* SYNTHETIC *products*

. . . most important★ advantages of Buell Dust Recovery Systems

★A recent survey among Buell users —companies that have had their Buell Dust Recovery Systems in operation for three, four, five, or more years—brought to light a remarkable record for long life and trouble-free performance, freedom from clogging and absence of repairs.

The high efficiency and other *plus* advantages of Buell Dust Recovery Systems are the result of Buell's exclusive van Tongeren design. The van Tongeren "shave-off," for instance, makes possible a high recovery efficiency without resort to small-diameter cyclones. At the same time, the large diameter of Buell cyclones permits construction of extra-heavy metal and reduces abrasive wear—two important factors in the proved long life and low maintenance cost of Buell equipment.

In addition, large diameters permit Buell cyclones to be designed with large outlet openings that virtually eliminate clogging and do away with the necessity for constant supervision and attention.

Buell Dust Recovery Systems are used for the reclamation of valuable dusts and the abatement of hazardous dust nuisances by leading companies in every branch of industry.

Write for factual, 28-page book, Bulletin G-482.

A partial list of well-known Buell users

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BETHLEHEM STEEL CO.
BUICK MOTOR CAR COMPANY
THE CONNECTICUT LIGHT & POWER CO.
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FORD MOTOR COMPANY
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DUST RECOVERY SYSTEMS

BUELL ENGINEERING COMPANY, INC.
Suite 5000, 12 Cedar Street, New York 5, N. Y.
Sales Representatives in Principal Cities

BUY WAR BONDS AND MAKE THE AXIS BITE THE DUST

PIT AND QUARRY

CHICAGO DECEMBER, 1943

Activity in Gypsum Industry Continues Earlier Decline

Over-all activity in the gypsum industry continued to decline in the July-September quarter of 1943, although not in nearly as marked degree as the slump in construction activity.

The general reduction in rate of operations is indicated by the respective declines of 13 and 9 per cent. in mine output and calcined production below outputs during the third quarter of 1942, as reported to the Bureau of Mines. In comparison, new construction activity during July-September, according to Department of Commerce estimates, was 57 per cent. below that of the same period in 1942. However, operations of the gypsum producers reached peak activity during the first quarter and had declined sharply by the third quarter of 1942, whereas construction did not attain its peak until in the July-September period of 1942. Further falling-off in gypsum-industry activity is indicated by the slump in building-contract awards which in September, 1943, as reported by the Dodge Corporation, were below September, 1942, by 57 per cent. for residential and 85 per cent. for nonresidential construction.

Medusa to Rebuild Docks at Holland

The Medusa Portland Cement Company is to rebuild and improve its 15- by 325-foot dock at its Holland, Michigan, storage and packing plant. The improvements are necessary because of damage caused by high water which is at its peak on Lake Michigan this year, according to Clarence Anderson, superintendent.

Since priorities do not allow the use of steel piles, wooden piles will be used and work will begin as soon as supplies are received. The dock will have a concrete deck. The contract has been let to the L. W. Lamb Construction Company of Holland.

Anderson County Leads in Use of Agstone

Anderson County in Kansas ranked first in that state in the use of agricultural limestone under the A. A. A. program for the fiscal year ending September 30. Butler County was second with 11,729 tons, Franklin County third with 10,775 tons, followed by Greenwood with 8,367 tons and Bourbon with 6,205 tons.

A quarry and crushing plant is being opened near Jerseyville, Illinois, by Carl and Albert Sievers.

Coming Events

January 16-21, 1944 — Chicago. Annual convention and silver-anniversary meeting, Associated Equipment Distributors, Edgewater Beach Hotel.

January 25-27, 1944 — New York. Annual convention, National Sand & Gravel Association, Hotel New Yorker.

January 26-28, 1944—New York. Annual convention, National Ready Mixed Concrete Association, Hotel New Yorker.

January 31-February 2, 1944 —New York. Annual convention, National Crushed Stone Association, Hotel New Yorker.

February 9, 10, 1944 — Chicago. Annual convention, American Concrete Pipe Association, Drake Hotel.

February 16, 17, 1944—Chicago. Annual convention, National Concrete Masonry Association, Sherman Hotel.

Inland Lime Opens Large Distributing Yard in Milwaukee

In order to speed service to contractors engaged in war construction and industrial users of its products, Inland Lime & Stone Company recently opened a new yard in Milwaukee and completely reorganized its operations. The result was 100 per cent. elimination of rehandling of materials, with important time and cost savings to its customers.

The new yard has railway, waterway, and truck-shipping facilities. Aggregates are received by boat from the producing plant at Port Inland, near Manistique, Michigan.

Equipment in the new Milwaukee yard consists of a 20-ton Butler platform scale housed in the office building, two 80-ton Butler truck-loading bins, a 42-B Barber-Greene bucket loader and a Bucyrus-Erie 20-B clamshell crane with a Williams 1-cubic yard bucket. The two hoppers, kept filled with popular-sized aggregate by the crane, provide gravity loading of trucks for deliveries to local contractors. Smaller sizes are loaded from stock pile by the Barber-Greene loader which averages 50 tons per hour. Odd-size aggregate is loaded by crane direct from stock pile to trucks.

Rain Bombs on Cement Plant Held by Japs

American-manned bombers dropped more than 20 tons of explosives on the cement plant at Haiphong, in Japanese-held China, which had just resumed operations two weeks previously after a previous bombing, according to press reports. Photographs showed heavy bomb bursts blanketing the area. The plant was the source of material for the construction of runways, docks, and other buildings on Hainan Island and Indo-China.

Cement Makers Look to Post-War Period with Confidence

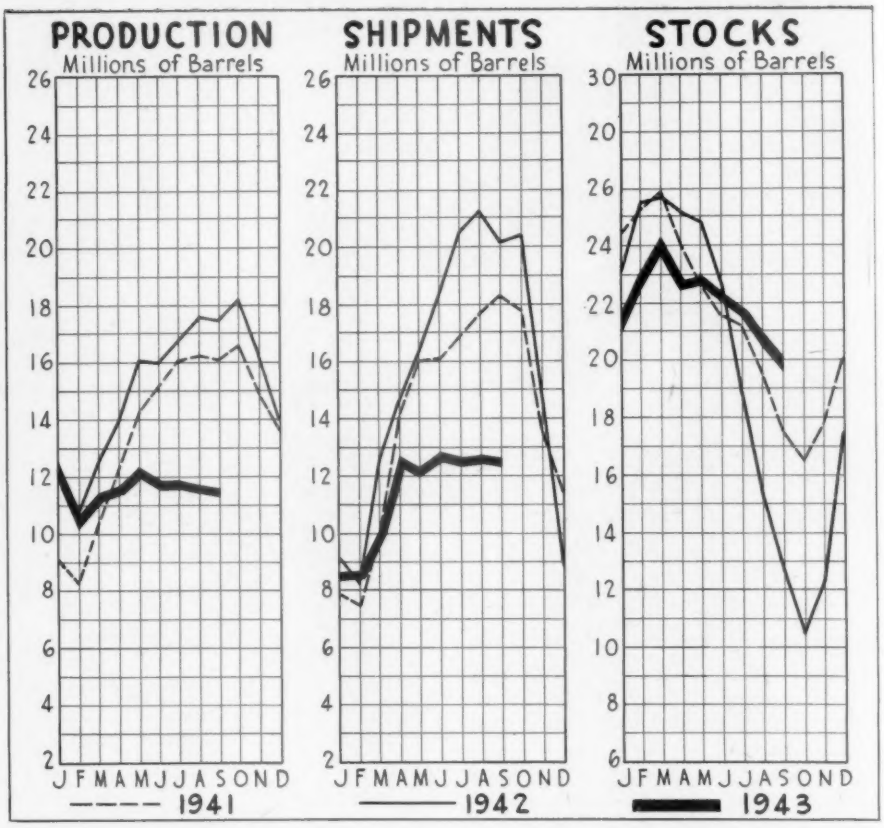
The cement industry is experiencing a sharp decline in production and shipments this year, output being down about 28 per cent for the January-September period as compared with the first nine months of 1942.

This is being reflected in the decline in earnings of cement companies reporting for the 12 months ended September 30 and is due in turn to the general construction decline, particularly in road-building, heavy construction and public works.

In ordinary times about two-thirds of the cement production in the United States is used for structural concrete and for pavings and highways with 17 per cent. going for farm uses, 8 per cent for concrete masonry —block pipe, tile, etc.—and 6 per cent. for railroad work.

The decline in construction has been the greatest in those fields which are the greatest peacetime consumers of cement such as bridges, dams, water-power projects, storage tanks, reservoirs, river and harbor work and road-building.

The industry is looking forward to the postwar era with confidence, however. For one thing, it recently has perfected a greatly improved concrete which has proved highly durable in practical tests on roads and airport runways under severe climatic conditions. The use of this so-called "air-entraining cement" in road-building concrete practically eliminates any surface scale caused by freezing, thawing and application of salt for ice removal. *(P & Q,* October, 1943, page 91.) Hence it is expected that there will be an increase in the relative amount of concrete road construction in respect to the total highway construction after the war.



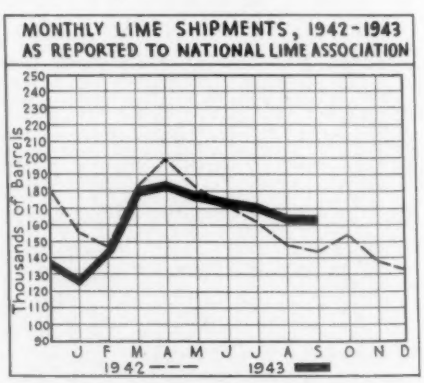
The Portland-cement industry in September, 1943, continued its decline which began in May of this year. According to the Bureau of Mines, September production was 11,380,000 barrels, a 35-per cent. decline from the same month last year. Shipments in September, 1943, totaled 12,296,000 barrels, off 39 per cent. from September, 1942. Stocks at the end of the month were 19,704,000 barrels of cement. During the month, 56 per cent. of the total producing capacity was in use compared with 87 per cent. in September, 1942, the Bureau of Mines reports.

A wider use of concrete-masonry units, production of which has increased 400 per cent during the last 20 years, also is anticipated after the war. In 1941 a record total of almost 360,000,000 concrete blocks was produced by some 3,000 plants in the United States and Canada. Last year, with construction activity on the decline, the total was around 301,000,000. Production of concrete pipe reached a new high last year with a total of 4,852,000 tons and, with the shortage of metals, this uptrend is continuing.

3 Injured in Quarry Slide in Arkansas

A slide in the quarry of the Arkansas Products Company at St. Jose, Arkansas, on October 13, resulted in injuries to three men who were drilling into the face of the granite bluff.

Those injured were: C. L. O'Daniel, who suffered a broken arm and serious injuries to right ankle and foot; Everett Herron, who suffered scalp lacerations and chest injuries, and Charles E. Fortner, a crushed hand and cuts. Overburden and rock on top of the bluff are believed to have been loosened by a heavy rain the previous night. The men were rescued by other plant workers.


MONTHLY LIME SHIPMENTS, 1942-1943
AS REPORTED TO NATIONAL LIME ASSOCIATION
Thousands of Barrels
J F M A M J J A S O N D
1942
1943

According to data collected by the National Lime Association, 63 companies in September, 1942, shipped 161,218 tons of lime (113,210 quicklime; 48,008 hydrate). Reporting companies represent 44.1 per cent. of the association's total capacity of record. Based on PIT AND QUARRY'S estimates for the remainder of the industry, the total shipments for the month by all plants were approximately 455,000 tons. Shipments of lime by users for September, 1942, were:

Use	Quicklime (tons)	Hydrate (tons)
Agricultural	2,845	10,858
Building	8,351	15,630
Cremical	102,014	21,520
Total	113,210	48,008

Paid Circulation of Pit & Quarry Among Nonmetallic - Mineral Producers In Recent Years:

1942	(November)	6,650
	(May)	6,513
1941	(November	6,179
	(May)	5,945
1940	(November)	5,307
	(May)	5,037
1939	(November)	4,641
	(May)	4,617
1938	(November)	4,496
	(May)	4,366
1937	(November)	3,971
	(May)	3,772
1936	(November)	3,654

CONTINUOUSLY FOR 26 YEARS THE LARGEST PRODUCER CIRCULATION IN THE FIELD

82% increase in 6 Years

Conventions Feature Informal Sessions, Round-Table Talks

For many years the National Sand and Gravel Association and the National Ready Mixed Concrete Association have had identical convention dates. A slight change has been made in this respect for the forthcoming meetings. The dates for the sand-and-gravel meeting are January 25, 26 and 27 at the Hotel New Yorker, New York City with the annual board meeting taking place on January 24. The National Ready Mixed Concrete Association will meet at the same place but its dates will be January 26, 27 and 28. Thus the sand-and-gravel industry will have one day—January 25—which can be devoted exclusively to problems of its industry; the National Ready Mixed Concrete Association will also have such an exclusive day — January 28 — when there will be no conflict of any kind with sand-and-gravel meetings.

This new arrangement for dates was prompted by the statements of many members that they did not like to be required to make a choice between concurrent meetings of the sand and gravel and ready mixed concrete industries. Thus the policy at the New York meeting will be to give companies interested in both industries more opportunity to attend all sessions, V. P. Ahearn, executive secretary, points out.

The two organizations will come together on January 26 for a program of joint interest. Included among the speakers at that time will be: Maj. Gen. Philip D. Fleming, administrator, Federal Works Agency, on the subject of the Federal post-war public works program; Col. Willard T. Chevalier, publisher, *Business Week,* on the post-war world in which business will function; and Thomas S. Holden, president, F. W. Dodge Corporation, on the construction outlook for 1944. Details of the rest of the program will be announced later, but the dominating policy will be to have informal sessions of a round-table character, pointed specifically to the problems of the industry in times of war.

There will be a reception by the members of the Manufacturers Division from 5:30 p. m. to 7:30 p. m., on the evening of January 26, but otherwise there will be no entertainment features, it having been decided to cancel out the customary annual dinner. This was done in deference to the fact that hotels have manpower and rationing problems which make it difficult for them to handle meals outside the regular dining facilities; furthermore it was felt that those attending might like to have the opportunity to spend their evenings in New York according to their individual desires.

The National Crushed Stone Association will gather for its annual convention at the New Yorker on the following week. The dates for this gathering are January 31, February 1 and 2.

Oregon Lime Maker Adds Second Kiln

A second lime kiln has recently gone into production at the plant of the Washington Brick & Lime Company at Williams, Oregon.

The new kiln has a capacity of 15 tons of burned lime per day.

Gravel Company Aids War-Fund Campaign

The Caruthersville Sand & Gravel Company of Caruthersville, Missouri, was one of eight firms of that city that underwrote the cost of the newspaper advertising for the National War Fund Drive in Pemiscot County, Missouri.

Charter of Staunton Lime Firm Revived

The Virginia State Corporation Commission has revived the charter of the Staunton Lime Corporation, Staunton, Virginia. Robert L. James is president of the firm which has a maximum capital of $50,000. Mr. James secured the charter revival.

Celotex Adopts New Gypsum Trade-Mark

All Celotex gypsum building products are now being distributed and sold under the new trade-mark of "Celo-Rock," according to an announcement by Henry W. Collins, vice-president in charge of merchandising.

Reorganization Plan Developed for Big West Coast Concern

After eight years in bankruptcy, the Consolidated Rock Products Company of Los Angeles is about to be reorganized. This $4,000,000 corporation, operator of a number of aggregates and ready-mixed concrete plants in and around Los Angeles, first filed a bankruptcy petition in Federal Court in 1935. In 1938 a United States District Court approveed a reorganization plan. In 1941, the United States Supreme Court ruled that the plan was unfair to bondholders.

Holders of bonds and preferred stocks are now being furnished details of a new reorganization plan developed jointly by two bondholders committees and a committee for preferred stockholders.

Under the plan the firm will have a simplified capital structure. Only two classes of securities will be outstanding. One class will consist of $2,944,000 first-mortgage bonds. They will bear interest at 3 per cent. and will carry an additional 2 per cent. non-cumulative interest rate. The other security will be 3,197,000 shares of $1 par common stock.

Holders of present bonds, issued by the Union Rock Company and by the Consumers Rock & Gravel Company, Inc., will receive all of the new bonds and 80 per cent. of the new stock. Holders of present preferred stock of Consolidated Rock Products Company will receive the remaining 20 per cent. of the new stock. Holders of the present common stock will get nothing.

For each $1,000 bond now owned, bondholders will receive a new $1,000 bond, between 832 and 892 shares of new stock (depending on the amount of accrued interest on the old bond) and $65 in cash.

Each holder of 100 shares of preferred stock will receive 223 shares of the new common stock.

The plan prohibits dividends on the new stock until the new bonds have been reduced to $1,250,000.

The reorganization proposal has been approved by United States District Judge Harry A. Hollzer. It must be accepted by two-thirds of the bondholders and a majority of the preferred stockholders.

The Independent Construction Company of Oakland, California, is planning to install a sand-and-gravel plant near El Cerrito this winter.

The plant will serve government construction jobs in that vicinity.

Lime-putty "pit" in yard of the Vancouver Lime Company.

British Columbia's Lime, Stone Plants Need More Workers

Labor is the number one headache in the limestone quarrying and lime industry in Canada's westernmost province of British Columbia. Booming business makes the problem more keenly felt. There is hope that the Selective Service is taking steps to alleviate the situation but at present things are approaching the critical stage.

The quarry, kilns and grinding mills of the Pacific Lime Company are located at Blubber Bay, near the town of Powell River, about 70 miles up the coast from Vancouver. The plant has four rotary kilns. At present an inadequate crew of 150 men is employed. The products are shipped out in tug-drawn scows.

A slacking and aging plant is situated in Vancouver, as is the main office. Aging here is of at least a month's duration and the plant has a storage capacity of 400 cubic yards. A spokesman here stated that the men directed to them for employment by the Selective Service would consider truck-driving jobs only, and would not accept employment in the plant.

The products of the two plants are sold to pulp mills in British Columbia, Washington and Oregon; to mines; to carbide plants; for agricultural purposes; and to the building trade. The inability of contractors to obtain sufficient supplies of cement, lumber, plumbing and electrical equipment for civilian building, due to defense-work priorities, has drastically curtailed the building market for the time being. Then, besides the labor situation, there is a shortage of scows for hauling down from Blubber Bay.

Beale Quarries, Ltd., do no burning. The quarry and grinding mill are located on the north end of Texado Island, where the area is described as "one mass of limestone." This island—about 35 miles long—is in the Straits of Georgia, between Vancouver Island and the mainland.

Thirty men are employed at present, 90 per cent. of them living there permanently. For three months it has been impossible to obtain additional labor.

The big-selling product here is "pulp rock" for the acid vats of the British Columbia pulp mills. For this purpose the rock is blown off the quarry face then cracked by hand into chunks weighing between 50 and 150 pounds. In this condition it is shipped in scows to the mills. Before the war 20 to 30 tons weekly was shipped, but the tonnage shipped in this period has risen to around 100.

S. C. H. Millard, manager, stated that if he had the labor and the shipping he could sell 1,000 tons of pulp rock immediately to pulp mills in the State of Washington. Needless to say, these are unavailable.

Two grinding mills produce ground limestone for agricultural purposes and for poultry ranches.

This company, in common with the Pacific Lime Company, produces also for markets which war-time regulations prevent being disclosed.

The Vancouver Lime Company specializes in purchasing lime, treating it and delivering the resulting ready-mixed product right to the job, to building contractors. Some agricultural lime is handled, as well as cement, sand and gravel. Of these, cement is at present almost unobtainable for civilian building purposes due to its having been diverted to defense work.

Unfortunately, due to the comparative lull in the civilian building line and the labor situation, this company has recently been forced to temporarily shut down the plant. But as much of the defense work is now nearing completion and a greater release of materials for civilian building is thus anticipated, and as the government is reportedly giving serious attention to the labor shortage, the immediate future is not too gloomy.

Seek Quick Revival of Private Construction After War Ends

The War Production Board has issued what it called a Statement of Policy, continuing the restriction of construction of new facilities and reducing facilities under construction to the minimum regarded as necessary to the war program and for essential civilian needs. The full text of the statement follows:

"It shall be the continued policy of the War Production Board to restrict construction of new facilities and to reduce facilities under construction to the minimum necessary for the war program and for essential civilian needs, in order to conserve to the utmost all resources for the production of war supplies and equipment. In accomplishing this result, the Board will in each case seek a minimum consumption of materials and manpower, together with maximum utilization of existing facilities and equipment. The Directive for Wartime Construction dated May 20, 1942, which established these principles is hereby affirmed."

Recently WPB's Director of the Office of Civilian Requirements, A. D. Whiteside, invited representatives of the construction industry selected by the U. S. Chamber of Commerce to confer with WPB officials in the interest of planning an orderly resumption of civilian construction activities as developments in the war emergency permitted. Charles Warner, president of the Warner Company, Philadelphia, was a member of the committee and attended its preliminary meeting in Washington on September 14. The Committee met with Mr. Whiteside and his associates on the following day, and in Mr. Warner's unavoidable absence, V. P. Ahearn, executive secretary of The National Sand & Gravel Association, acted as his

substitute. A statement was submitted by management members of the Committee, through its spokesman, Frank Sheets, president of the Portland Cement Association. The statement follows:

STATEMENT BY MANAGEMENT

"We, representing a cross-section of the construction industry, who have been invited by the WPB to confer on problems related to the war and civilian requirements now facing our country, wish at the outset to make clear our position. We do not advocate, nor will we advocate any measures which we do not believe compatible with the war effort.

"Successful prosecution of the war requires that all of our physical facilities, including industrial, commercial, housing, railway transportation, highways and streets, food production, water supply and sanitation, and other facilities essential to the public health, welfare and safety, be maintained in safe and efficient service. This is the minimum need, if maximum war production is to be maintained. Maintenance alone will not hold all of them at an efficient level indefinitely, and some reconstruction and replacement, some expansion and new construction are becoming increasingly necessary.

"To attain these ends it seems highly desirable that the WPB and those engaged in lines of endeavor essential to providing these facilities, make a realistic appraisal periodically to determine what portion of our manpower and materials can be allocated to maintaining and improving the facilities cited without interference with the production of material required for the support of our armed forces.

"During the period of tuning up for war production, the construction industry satisfactorily fulfilled its obligation and provided plants, housing, and military establishments with a rapidity and efficiency heretofore unexcelled in the world's history.

"Few of the nation's basic peacetime industries have experienced more drastic war-time restriction than that which has seemed necessary in the field of private building and construction. The annual volume of new construction for the civilian economy has been reduced from a 1941 level of about $8,000,000,000 to less than $2,500,000,000 during the current year. There is a grave question as to whether the current level of civilian construction can be much further reduced without danger of curtailment to a point where indispensable civilian needs will be sacrificed. It may well be that difficulties exist with respect to carrying out essential maintenance and repair work which might be removed without detriment to the war program, and thus facilitate maintenance that can not be further deferred if our civilian facilities are to be safely and efficiently operated.

"If, as and when war conditions permit, opportunity should be afforded to resume gradually an accelerated rate of civilian construction so that we may regain as much as may be the loss which has been sustained due to the substandard maintenance of such facilities which has prevailed during the last two years and provide the replacements and new facilities, the need for which is becoming increasingly apparent.

"Therefore it seems highly desirable now that we start to plan this program of orderly reconversion from maximum war production on a step-by-step basis, to the end that, as war workers and service men are released they may be absorbed in our economy and their talents devoted to useful enterprise.

"Only the war agencies, the WPB and the WMC have access to the confidential information and statistical facilities which are needed to tell us which materials and what segments of the nation's manpower will become available first. When those facts are known, the construction industry can then proceed intelligently with its preparation to meet the critical problems which must be faced from now until the end of the war and the even more critical problems which must be faced at the close of hostilities."

It was stated that the man-power problem was about to become considerably aggravated and that WPB felt that its first responsibility was to compel the maximum utilization of limited man-power facilities in the production of implements of war. Furthermore, there was accumulating evidence of an impending transportation crisis, second in importance only to man-power difficulties. The combination of manpower and transportation difficulties undoubtedly explains the later restatement by WPB of its opposition to any new construction which could be postponed until after the war is won.

It will be incumbent upon applicants for new construction to show WPB that disapproval will retard the war program. No exception can be taken to the position of management that it will not advocate any construction which is not compatible with the war effort, nor can criticism be made of WPB determination to screen out all projects which can be safely postponed; but there is evidence that the country's highway and street transportation facilities in many parts of the country, have reached a dangerous stage of disrepair. Furthermore, housing and public works to service the housing are inadequate. The way is open for WPB to approve strong showings for essential construction, and right now, at least, war housing is getting as much attention as any other phase of fighting the war.

Through this Construction Industry Committee, the U. S. Chamber of Commerce will continue to give construction forces an opportunity to maintain constant contacts with WPB and to make plans for revival of construction after the war in order to overcome the tremendous shortages which are accumulating daily. A start has already been made toward the planning of a program of orderly reconversion of the construction industry to the meeting of peacetime needs, although reconversion in the ordinary sense will not be required in the construction industry.

Perhaps when the European phases of the war are completed, WPB will find that aggressive prosecution of the war against Japan will still make it possible to relax the official ban imposed in the L-41 Order. It is most unrealistic, however, to hope for approval of any construction not of the most essential kind until the European war has been conclusively terminated.

Save with
War Savings Bonds

Prohibit Cement Imports in Dominican Republic

The importation of cement into the Dominican Republic has been prohibited except under prior import license issued by the Committee of Control of Prices of Construction Materials, according to a recent decree, the Department of Commerce has reported.

The purpose of the decree is to regulate the volume of imports of cement, a commodity not subject to import recommendation certificates, so that shipping space for this commodity, unless necessary, may not be used to the exclusion of more essential materials.

Checks on Inflation

It is difficult to allocate the blame for the wages - prices - cost of living dilemma which the country now faces as its number one problem on the home front. Selfish interest, misguided political maneuvering, resentment at the alleged failure of government controls, indifference to the grave economic issues involved—or lack of understanding of these issues—all have contributed to the present impasse.

The Congress, the Administration, organized labor, farm and business groups, even the general public share in the responsibility for past errors of act and attitude, and the sooner this fact is recognized the more expeditiously can the way be cleared for an intelligent resolution of apparently conflicting interests. In this sphere, such conflict can only be *apparent,* never *real,* for the interest and welfare of the American people as a whole transcend the interest of any individual group within the nation.

Indeed, there can be for no one group a lasting prosperity which is not directly associated with the well-being of all. In this sense national welfare is synonymous with individual interest, and understanding and coöperation between groups to achieve nation-wide prosperity is thus a primary requisite to the well-being of each group. This is a fundamental economic truth, and any individual advantage based upon a contradictory state of affairs is illusory and doomed to failure.

We are coming more and more to realize the importance of coöperation on the international level in order to attain the welfare of all nations, and to understand, for example, that in the equation of global affairs world peace can only be balanced by the assurance of peace in every part of the world.

Perhaps the greatest of all the many dangers of the inflationary spiral is that it develops and accentuates group antagonisms, splits a nation into many parts, all of whose interests are intimately tied together, yet all working against each other until disaster overtakes them. Let no one doubt the inevitability and at the same time the far-reaching consequences of such a disaster once the cost-of-living situation gets out of hand. It used to be a commonplace that the United States would have to be bombed before its citizens would become fully aware of their stake in this war. Perhaps the holocust of inflation must also be personally experienced before the importance of avoiding it can be fully appreciated. Yet we have within our own time the experience of other nations and other peoples to warn us of the menace we face if we continue to err in our handling of this problem.

What makes the present situation so dangerous is that, while professing to be against inflation, farm, labor and business groups are all pressing for the acceptance of demands which are definitely and seriously inflationary and which all add up to the same thing—more money income for themselves in the near future, less real income for everybody in the long run. The Administration has been partly at fault through its failure to educate the public in the ABC's of inflation and through its inability to hold down the level of prices, although in all fairness it should be said that it has not had complete coöperation from the press and radio facilities of the nation. The Congress has contributed nothing but confusion, first by its refusal thus far to vote the subsidies and administrative funds needed to make price control effective, and, second, by its repeated unwillingness to legislate a tax measure of satisfactory proportions.

Most labor leaders appear to have honestly and effectively coöperated in the President's anti-inflation program, but, discouraged by official bungling and wearied by the concessions made on the other points in the program, their succumbing to the pressure from their membership for remedying the inequities of the "little steel" formula becomes understandable. To understand, however, is not to justify. No one stands to lose more from a runaway inflation than does the man in the street. Despite its present squeezed position, labor is generally better off now than ever in the history of this nation. It is a bitter and difficult pill to swallow, but the welfare of labor and the national economy as a whole would be impaired by a general wage increase, which would only boost the cost of living still higher. Union leaders might yet undertake to convince their members of the inescapability of this dictum, were they themselves persuaded of the Administration's capacity to keep prices in line.

Meanwhile, the farmer, facing higher costs of help, feed, and manufactured goods, and recalling the lean years of the past decade, presses for still higher food prices. The cheapest and least inflationary substitute for a price advance is the direct subsidy. Congressional disapproval of this plan has found the backing of distributors who would get part of the price rise, and of many agricultural groups who, regarding farmers as producers, forget that they are also consumers. To complicate matters, as a debtor the farmer, particularly in certain areas, is almost anxious for an inflation which would permit repayments in a cheaper money; that economic disaster would kick the bottom out of his market is less easily perceived.

One thing emerges clearly from the present Congressional battle. The government agencies responsible for economic stabilization are unanimous in their opinion that the price line can not be held without subsidies, nor can wage demands be withstood. Subsidies, while not the final answer, would definitely improve the prospects of controlling the situation. Inflation holds TNT for the present and future welfare of the country. It should be guarded against by all parties concerned, with due respect to its catastrophic potentialities, not played with as is happening on Capitol Hill.

October Building Up Over September Total

Construction contracts awarded during October totaled $213,529,000 in the 37 eastern states, according to F. W. Dodge Corporation. This reprecents an increase of $38,414,000, or 22 per cent. over the preceding month but is 71 per cent. below October of last year. All major types of construction showed an improvement over September, 1943.

All classifications of non-residential building, with the exception of Miscellaneous non-residential buildings equaled or exceeded the prior month's contract valuation. Residential building valuation for the month showed a substantial increase of 29 per cent. over September but was 57 per cent. behind October, 1942.

CONSTRUCTION LIMITATION REVISED.—A completely re-drafted Order L-41, which limits construction, was issued in simplified form by the War Production Board November 1. The new language of the order is intended to make the restrictions more easily understandable by the public.

Typical of the language of the revised order is its introduction explaining the purpose of L-41: "This order limits construction. It is necessary in order to conserve materials, construction equipment, labor, and transportation. In most cases, except where the construction is of a special kind, you must get permission from the War Production Board for construction."

The introduction goes on to explain that this permission is not to be confused with preference ratings or priorities: "If a construction job is allowed, either because it is not of the kind restricted by the order or because permission has been obtained, it may still be necessary to get preference ratings for the materials and fixtures which are needed. On the other hand, if you have ratings for materials, or materials on hand, you may still have to get permission to use them for a particular construction job."

In addition to simplifying the regulations and instructions, the revised order makes the following substantive changes:

1. The limit on farm construction, including residential, is placed at $1,000. Previously, there were separate limits, farm residences not being considered part of the farm unit.

2. A limit of $200 is placed on any type of construction for which a higher specific limit is not authorized by the order. This over-all limit formerly was $1,000.

3. The exception, originally made by L-41-b, for the insulating of buildings, has been liberalized in accordance with WPB policy relating to fuel conservation. On the other hand, the exception covering the conversion of heating equipment from oil to coal has been eliminated because of the tight coal situation.

4. Minor capital additions under CMP Reg. 5 in certain of the more essential industrial plants are excepted from the L-41 restrictions.

5. In calculating costs to determine if a job is within specified L-41 limits, the cost of used materials, or the value of labor furnished free, need no longer be included.

6. Cost limits now refer to the calendar year, instead of to any consecutive twelve months period.

7. Installation of plumbing equipment rated on WPB-2631 (formerly PD-851) is permitted if the cost is under $200.

8. Schedule B, listing various kinds of construction relating to operations of farms, railroads, utilities, mines, etc. which may be begun without WPB permission, has been altered in several respects. Drilling of water wells, certain radio facilities, and timber access roads financed wholly or in part by defense highway appropriations have been added.

With issuance of the revised L-41, Orders L-41-a, L-41-b, L-41-c, and Interpretation No. 1 are revoked inasmuch as their provisions are either incorporated into, or altered by, the new order. As the order has been entirely rewritten, the full text is given below:

PART 1075—CONSTRUCTION
[Conservation Order L-41 as Amended November 1, 1943]

Conservation Order L-41 is hereby amended to read as follows:

§ 1075.1 *Conservation Order L-41*—(a)—*What this order does.* This order limits construction. It is necessary in order to conserve materials, construction equipment, labor and transportation. In most cases, except where the construction is of a special kind, you must get permission from the War Production Board for construction. This permission (sometimes called "authorization to begin construction") must not be confused with preference ratings or priorities. If a construction job is allowed, either because it is not of the kind restricted by this order or because permission has been obtained, it may still be necessary to get preference ratings for the materials and fixtures which are needed. On the other hand, if you have ratings for materials, or materials on hand, you may still have to get permission to use them for a particular construction job.

(b) *What is meant by construction.* Construction covered by this order includes putting up or altering any sort of a structure, including a building, road, bridge, dam, sewer, and similar jobs; also the installing of equipment or fixtures. Certain special kinds of construction are excepted, as explained in paragraphs (c) and (d) below.

(c) *How much construction is allowed without getting permission.* You need not get permission under this order for construction which does not total more than the limits shown in the following list for all jobs begun in the same year. For an explanation of how to figure "cost," see paragraph (i). If a utility connection will be required (electricity, gas, water, steam or telephone), it may be necessary to get War Production Board approval for the connection. If so, approval for the connection must be obtained *before* beginning construction, even if the cost of construction comes within the limits. The limits for all jobs begun in the same year are as follows:

(1) $200 for a house, including the entire residential property.

(2) $1,000 for a farm, including the farm house; a farm means a place used for raising crops, livestock, dairy products, poultry, etc., primarily for the market.

(3) $1,000 for a hotel, apartment building, or other residence for six or more families. Any residence for five or less families is considered a house under (1) above.

(4) $200 for an office, bank, store, laundry, garage, restaurant, or other retail service establishment, except that the limit is $1000 for a unit containing more than five establishments of this kind.

(5) $1,000 for a church, hospital, school, college, public playground for children, or for a publicly owned building or group of buildings used for public purposes.

(6) $1,000 for a bridge, overpass, underpass, tunnel, dock, pier, bus terminal or for a railroad or street railway building or group of buildings.

(7) $1,000 for an irrigation or drainage system serving more than one farm.

(8) $1,000 for a building or group of buildings which will be used for warehouse or for off-farm storage purposes.

(9) $1,000 for all monuments and structures on the same cemetery lot or for all cemetery buildings or structures in the same cemetery.

(10) $1,000 for a military exchange situated on a reservation of the Army or Navy.

(11) $1,000 for a building or group of buildings which will be used directly in furnishing any of the electric, gas, water or heating utility services listed in paragraph (a) (1) of Order U-1, and which will be owned by a utility producer as defined in that paragraph, or which will be used directly in furnishing communication services and which will be owned by an operator as defined in paragraph (a) (1) of Order U-2, or in paragraph (a) (1) of Order U-3, or which will be used directly for a sewage system and owned by a sewage system operator as defined in Order P-141.

(12) $5,000 for a factory, plant or other industrial unit which is used for the manufacture, processing or assembling of any goods, except that the limit is $200 if the goods are listed on Schedule A at the end of this order or if the productive floor area of the unit upon completion of construction is less than 10,000 square feet.

(13) $200 for any other kind of construction.

(d) *Special kinds of construction which do not require permission.* It is not necessary to get War Production Board permission under this order for the following kinds of construction:

(1) Maintenance and repair: that is, work necessary to keep a building or structure in sound working condition or fix it when it has become unsafe or unfit for service because of wear and tear; also the minimum work necessary to prevent more damage to a building or structure (or its contents) which has been damaged by fire, flood, tornado, earthquake, acts of war, or the like. Changes in material are permitted in doing maintenance and repair work. Additions, structural alterations, or the completion of unfinished parts of buildings are not considered maintenance and repair. Rebuilding or restoring after damage caused by fire, flood, tornado, earthquake, acts of war, or the like, is not permitted as maintenance and repair, but is permitted in some cases as explained below.

(2) The rebuilding or restoring of a house (including a farm house) or other residential building damaged or destroyed after July 1, 1943, by fire, flood, tornado, earthquake, acts of war, or the like, if the cost of rebuilding or restoring is less than $5,000.

(3) The rebuilding or restoring of farm buildings damaged or destroyed by fire, flood, tornado, earthquake, acts of war, or the like, if the cost of rebuilding or restoring is less than $5,000, where the immediate reconstruction is determined by the United States Department of Agriculture to be essential to the agricultural program.

(4) The rebuilding or restoring of a building or structure damaged or destroyed by disaster, where the Red Cross has been given priority assistance to restore the disaster area, and where the rebuilding or restoring has been determined by the Red Cross to be essential.

(5) Construction necessary to prevent threatened loss of farm products, where immediate construction is determined by the United States Department of Agriculture to be essential to the agricultural program.

(6) Construction owned by the United States Army, Navy, Maritime Commission, War Shipping Administration, Coast Guard, Marine Corps, Civil Aeronautics Authority, Coast and Geodetic Survey, or Panama Canal.

(7) Insulating buildings with materials such as storm windows and doors, pipe covering, loose fill, blanket or bat insulation, plain or granule surfaced rigid insulation, and weather stripping.

(8) Installing plumbing or heating equipment rated on WPB-2631 (PD-851), if the cost of installation (not including the cost of the equipment) is less than $200.

(9) Grading, ditch-digging or similar earth-moving operations, if no cement, lumber or other building materials are used, except clay tile and non-reinforced concrete pipe.

(10) Various kinds of construction connected with the operations of farms, railroads, utilities, mines, the petroleum industry, logging camps, chemical plants, steel mills and broadcasting facilities as listed in Schedule B.

(11) A construction job which began before this order originally became effective (April 9, 1942), or at a time when the job was not limited by this order, and has gone on without interruption.

(12) Construction jobs which are classed as minor capital additions under CMP Regulation No. 5 or under CMP Regulation No. 5A. This exception applies only to:

(i) Additions to factories, plants and other industrial units which will have a productive floor area of 10,000 square feet or more, and which are for the manufacturing, processing or assembling of goods which are not listed in Schedule A.

(ii) Hospitals.

(e) *All other construction forbidden without WPB permission.* No person shall do any construction which has not been permitted by the War Production Board, unless it is of a kind described in paragraph (c) or (d) above. This prohibition applies to a person who does his own construction work, to one who gets a contractor to do it for him, and to any contractor or subcontractor who works on the job or gets others to work on it. It also applies to any supplier who furnishes material for the job if

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he knows or has reason to know that the construction has not been permitted.

(f) *How to apply for permission.* (1) Schedule C at the end of this order shows the various types of application forms, and where they should be filed.

(2) In case of emergency, application may be made by wire or in person instead of on a printed form. It must be made to the office in which a written application for the same construction should be filed. The following information must be given:

(i) Cause of the emergency (fire, flood, etc.).
(ii) What the building or structure is used for.
(iii) Type of construction.
(iv) Why immediate construction is necessary.
(v) Estimated cost of construction.

(g) *Preference rating includes permission in some cases only.* There are some forms of preference rating orders and certificates which are issued or have been issued for special kinds of construction and which include permission for construction although they do not say so. These are listed in Schedule D at the end of this order. In all other cases, a preference rating is not enough, unless the instrument which assigns the rating also states the construction is permitted under this order.

(h) *Other restrictions on use of some items.* Permission for construction or the exception of any construction from this order does not relieve any one from complying with the various WPB orders or directives which restrict the use of copper and other scarce materials or fixtures. If you do not know about these restrictions, consult the nearest War Production Board District Office.

(i) *How to figure cost.* (1) For the purpose of determining whether a construction job may be started without getting permission from the War Production Board, "cost" means cost of the whole construction job as estimated at the time of beginning construction, except that the cost of used material or used fixtures may be disregarded.

(2) If any materials or fixtures which have not been used are obtained without buying them, their value must be included as part of the cost.

(3) The cost of processing machinery or equipment need not be included but the cost of installing it and the cost of plumbing, heating, and air conditioning equipment and of all other equipment not used directly in the processing of materials must be included.

(4) The cost of labor must be included, but if labor is unpaid its value need not be included. Contractors' fees also must be included but architects' and engineers' fees need not be.

(5) All construction on the same unit must be included. The word "unit" means any group of buildings or structures (including roadways, pipelines, etc.), which are situated near to each other, and which serve the same general purpose, or closely related purposes. For example, each of the following is a unit: a house, together with a detached garage, tennis court, swimming pool, etc.; a farm, including the farm house, barn, hen house, dairy, etc.; a manufacturing plant with a number of buildings used for the same or different processes, together with administration buildings, cafeterias, etc. In no case may a single building or structure be treated as more than one unit.

(6) The cost per year must be determined on a calendar year basis, beginning with January 1, 1943, except that a company which regularly keeps its books on a fiscal year basis may use the fiscal year.

(j) *Penalties for violations.* Any person who wilfully violates any provision of this order or who, in connection with this order, wilfully conceals a material fact or furnishes false information to any Department or Agency of the United States is guilty of a crime and upon conviction may be punished by fine or imprisonment. In addition, any such person may be prohibited from making or obtaining any further deliveries of, or from processing or using, material under priority control and may be deprived of priorities assistance.

Issued this 1st day of November, 1943.

WAR PRODUCTION BOARD,
By J. JOSEPH WHELAN,
Recording Secretary.

SCHEDULE A

This schedule is referred to in paragraphs (c) (12) and (d) (12). In the case of a unit principally designed for the manufacture, processing or assembling of any of the following articles, the cost limit is $200 in any one year without getting permission:

(i) Athletic supplies, sporting goods, or toys or games.
(ii) Beverages, except milk.
(iii) Books, magazines, newspapers, greeting cards, or other printed or engraved matter.
(iv) Candy or chewing gum.
(v) Cigars, cigarettes, smoking or chewing tobacco or snuff.
(vi) Jewelry, watches, luggage, brushes, razors, pipes, and like articles for personal use or adornment.
(vii) Furniture, store fixtures, barroom fixtures, bowling alleys and the like.
(viii) Silverware, woodenware, household electrical appliances, draperies, rugs, and all other household appliances and equipment, but not including china and glassware.
(ix) Musical instruments.
(x) Stationery or office supplies.
(xi) Toiletries or cosmetic products as defined in Order L-171.
(xii) Wearing apparel of every sort, except for the Army or Navy and their auxiliaries, and except safety equipment or safety clothing as defined in Order L-114.

SCHEDULE B

Permission under this order is not necessary for the following kinds of construction which are referred to generally in paragraph (d) (10).

1. Construction on structures which are to be used directly in the discovery, development or depletion of mineral deposits.

Types of construction	Application form	Where filed
Farm construction, including farm buildings:		
Total cost less than $10,000.....	WPB-2570 (formerly PD-200-C)	Dept. of Agriculture County War Board having jurisdiction over the site.
Total cost $10,000 or more.....	WPB-617 (formerly PD-200)	Dept. of Agriculture County War Board having jurisdiction over the site.
War Housing owned by FPHA.....	Letter	WPB, Washington, D. C.
Housing for 5 families or less per building:		
Total cost less than $10,000 or construction consisting only of remodeling or rehabilitation.	WPB-2896 (formerly PD-105) and WPB-2897.1.	FHA Field Office having jurisdiction over the site.
Total cost $10,000 or more (except remodeling or rehabilitation).	WPB-2896 (formerly PD-105) and WPB-2897 (formerly PD-105A).	FHA Field Office having jurisdiction over the site.
Hotels and apartment houses for six or more families providing additional living quarters for war workers:		
Total cost less than $10,000 or construction consisting of remodeling or rehabilitation.	WPB-2896 (formerly PD-105) and WPB-2897.1.	FHA Field Office having jurisdiction over the site.
Total cost $10,000 or more (except remodeling or rehabilitation).	WPB-2896 (formerly PD-105) and WPB-2897 (formerly PD-105A).	FHA Field Office having jurisdiction over the site.
Hotels and apartment houses for six or more families not providing additional living quarters for war workers:		
Total cost less than $10,000.....	WPB-2570 (formerly PD-200-C)	WPB District Office having jurisdiction over the site.
Total cost $10,000 or more.....	WPB-617 (formerly PD-200) PR 1 PA..... WPB-2774	WPB, Washington, D. C. State Highway Department having jurisdiction over the site.
Public roads		
Water, gas, steam, electricity, telephone facilities for use by the public.	WPB-617 (formerly PD-200)	WPB, Washington, D. C.
Factories, plants and other industrial units:		
Total cost less than $10,000.....	WPB-617 (formerly PD-200)	WPB District Office having jurisdiction over the site.
Total cost $10,000 or more.....	WPB-2570 (formerly PD-200-C)	WPB, Washington, D. C.
All other kinds of construction:		
Total cost less than $10,000....	WPB-617 (formerly PD-200)	WPB District Office having jurisdiction over the site.
Total cost $10,000 or more.....		WPB, Washington, D. C.

2. Construction which is regulated by any petroleum administrative order issued by the Petroleum Administrator for War. (Construction of this kind is permitted only to the extent authorized by the applicable petroleum administrative order.)

3. Construction of telephone and telegraph facilities or equipment, other than buildings, if authorized or permitted under the terms of Order U-2 (§ 4501.1) or Order U-6 (§ 4501.21).

4. Laying railroad tracks, together with the construction of necessary operating facilities, but not including buildings, tunnels, overpasses, underpasses, or bridges.

5. Construction of facilities (other than buildings) which will be used directly in furnishing any of the electric, gas, water or heating utility services listed in paragraph (a) (1) of Order U-1 and which will be owned by a utility "producer" as defined in that paragraph.

6. Construction of facilities (other than buildings) which will be used directly for a sewerage system and will be owned by a sewerage system "operator" as defined in Order P-141.

7. Installation or erection of rationed farm machinery, or mechanical equipment, which has been obtained on a purchase certificate issued by a County Farm Rationing Committee under Food Production Order 14 of the War Food Administration, or of wire fencing which has been obtained on P.R. 19 certification.

8. Drilling and casing of water wells, but excluding any use of pipe to conduct water on the surface.

9. Use by any logger or lumber manufacturer of lumber, nails, gravel, or clay products in construction needed to change the site of logging or lumbering operations; also the construction of timber access roads financed wholly or in part by defense highway appropriations.

10. Construction which is given priorities assistance under Order P-89 (relating to facilities for the manufacture of chemicals).

11. Construction which is given priorities assistance under Order P-68 (relating to facilities for the manufacture of steel).

12. Rearrangement or expansion of facilities and equipment, other than buildings, by an international point-to-point radio communication carrier to the extent that priorities assistance is granted under P-133 for such work.

SCHEDULE C

Application forms to be used in obtaining permission to begin construction under L-41 and where to file them, unless otherwise instructed. These forms are to be used whether or not priorities assistance or controlled allotments are required.

The "total cost" as used in the above schedule includes used materials and fixtures, processing machinery and equipment and architects', engineers' and contractors' fees although these are not included in "cost" for purposes of determining how much can be constructed without permission under paragraphs (c), and (d) of the order.

SCHEDULE D

The following preference rating orders or certificates are referred to in paragraph (g). If you have received one of these orders or certificates for your construction, the construction is permitted by the WPB.

P-19-e	Relating to public roads.
P-19-h ..... P-19-i ..... CMPL-127 ..... CMPL-224	Relating to projects important to the war effort or essential civilian needs.
P-55-b	Relating to privately owned programmed war housing.
WPB-2774	Relating to utility facilities.
PD-3A WPB-542	Relating to command construction and certain construction of the Corps of Engineers.
P-14-a ..... P-14-b ..... P-19 ..... P-19-a ..... P-19-d ..... P-19-g ..... P-41 ..... P-55 ..... P-55—amended... P-110 ..... PD-3	These orders and certificates are no longer used, but jobs which were authorized by them may go on.

INTERPRETATION 1

[Suspended by L-41, as amended November 1, 1943, which incorporates the substance of the interpretation.]

NOTE: The application forms specified in

Schedule C have been approved by the Bureau of the Budget in accordance with the Federal Reports Act of 1942.

EARTH-MOVING OPERATIONS.—An interpretation of Conservation Order L-41 (Construction) relating to ditch-digging and similar earth-moving operations was issued by the War Production Board November 23.

Paragraph (d) of the order declares that it is not necessary to get WPB permission for construction consisting of grading, ditch-digging, etc., if no cement, lumber, or other building materials are used except clay tile and non-reinforced concrete pipe.

The Interpretation (No. 3) points out that this applies only to projects which can be completed without the use of any other materials. In other words, the permission does not extend to earth-moving operations which are part of the construction job in which other materials will be incorporated before completion.

MINE RATING RAISED.—The War Production Board on October 30 issued Amendment 1 to Preference Rating Order P-56 as amended May 5, 1943, giving a preference rating of AA-5 to all non-serialized mines now having a rating of AA-2.

PAPER BAGS.—The situation with regard to paper bags of all kinds is tight, and probably will continue in that status for the duration of the war. The Containers Branch of WPB says that no real difficulty should be experienced during 1944 if orders for shipping sacks are placed from 60 to 90 days in advance for staggered deliveries throughout the year. It is extremely important, however, that producers anticipate their requirements as far in advance as possible, and arrange for the delivery of bags as needed within the limits of the inventory provisions of L-279.

As amended July 14, 1943, Limitation Order L-279 prohibited the use of asphalted paper in the manufacture of paper bags for packaging hydrated lime and limestone (other than mine dust). This restriction has been removed in a revised version of the order that was released on October 27, 1943. Special permission to use asphalted paper for these packages no longer is required.

The new order shows that it applies in the manufacture of paper shipping sacks for packaging lime and limestone in any quantity of 25 pounds or more. The inventory provisions of the amended order are essentially the same as before, but because of their importance they are repeated below.

No manufacturer shall accept delivery of paper shipping sacks which will increase his supply to more than the larger of the following amounts:

1. A total of 1½ carloads of all sizes and styles for all commodities (exclusive of sacks then in transit to him); or
2. Reasonably anticipated requirements of *each* size and style for any particular non-seasonal commodity during the next 90 days after the delivery of the sacks or any particular seasonal commodity during the next 120 days after the delivery of the sacks (with a ½-car leeway in either case, where necessary to round out a full car).

Any producer who maintains an inventory of sacks at more than one location has the option of applying the inventory restrictions either in the inventory of each such location separately, or to the collective inventory of all such locations. It is understood that filled bags in a warehouse are not to be included in such inventory.

PHOSPHATE-ROCK PRICES.— Producer prices for Tennessee phosphate rock have been increased approximately 20 cents per ton to compensate mine operators for wage raises recently granted to their employees, the Office of Price Administration announced November 29.

These wage increases so seriously reduced the small margin upon which owners operate that continued production was threatened. The increase in maximum prices will affect sales by operators to manufacturers. This increase will be absorbed by manufacturers and hence will not affect prices paid by the ultimate consumer.

Tennessee phosphate rock is used in the manufacture of fertilizers, chemicals and munitions; hence it is essential to the war effort.

The action followed hardship evidence submitted to OPA by companies for whose employees the War Labor Board recently approved wage increases retroactive to December 1, 1942. These companies mine and process 90 per cent. of the Tennessee phosphate rock sold. Half of them, under existing price ceilings, had to operate at a loss during the year ending June 30, 1943, and faced suspension of production. The others were compelled to function on so limited a margin that they were unable to absorb the wage increase and still show a profit.

The new schedule covers all grades and descriptions of Tennessee phosphate rock. (The action was taken through Amendment No. 3 to Maximum Price Regulation 240—Phosphate Rock, effective December 3, 1943.)

READY MIXED GETS AA-2.— Persons engaged in the manufacture of lightweight aggregates, ready-mixed concrete, and pre-mixed bituminous concrete are eligible to use the MRO symbol and the AA-2 preference rating assigned by CMP Regulations No. 5 to obtain maintenance, repair and operating supplies, the War Production Board said November 9.

This clarification, contained in Interpretation 10 to CMP Regulation No. 5, indicates that these items are included within the scope of the term "products for structural use not elsewhere listed" which appears in Schedule II of the Regulation and which indicates businesses which may use the AA-2 preference rating.

SILICA SAND IN SELECTIVE SERVICE.— The National Headquarters of the Selective Service System has announced that Activity and Occupation Bulletin 11 has been amended by the addition of the term "Industrial silica sand including foundry." The amendment was effective October 21, 1943, and is a part of Transmittal Memo No. 78 issued by the National Headquarters on that day, to all regional, district and local agencies, including local draft boards. The subject of the Transmittal Memo is "Amendments to Supplement to Activity and Occupation Bulletins." In that Transmittal Memo the Director of the Selective Service System, Gen. Lewis B. Hershey, stated that "the Activity and Occupation Bulletins referred to in this supplement will not be reprinted at this time."

This formal action of the National Headquarters of the Selective Service System will establish beyond all doubt the fact that the industrial sand industry is definitely included within the terms and provisions of Activity and Occupation Bulletin 11, whose general title is "Nonmetallic Mining and Processing and Quarrying." Most local draft boards have recognized the fact of the industry's being included in Bulletin 11 but some have balked and considerable correspondence with the Selective Service System and the War Manpower Commission followed.

A List of Essential Occupations approved by the Selective Service System for the Nonmetallic Mining and Processing and Quarrying Industries is appended. Formal inclusion of the industrial silica sand industry in the *List of Essential Activities* does not mean that producers have a right to apply for the deferment of all employees in the industry. Only the employments listed in the *List of Essential Occupations* are presumed to be subject to deferment, but even as to such employees, this industry must make a case with the local draft boards. Employers must file applications for deferments in meritorious cases with the appropriate local draft board.

The list follows:

PART III. ESSENTIAL OCCUPATIONS
NONMETALLIC MINING AND PROCESSING AND QUARRYING INDUSTRIES

- Accountant
- Air-compressor operator
- Assayer
- Blacksmith
- Blaster
- Brakeman
- Bulldozer or tractor operator
- Cager
- Carpenter, Mine
- Cashier (supervising)
- Chemical engineer
- Chemist, Inorganic
- Chief, Clerk
- Churn-drill operator
- Civil engineer
- Crane operator
- Diamond driller
- Draftsman, Mine
- Driller, Machine
- Electrical engineer
- Electrician
- Fireman, Stationary Boiler
- Foreman, Mine
- Foreman, Mill or Surface
- Geologist
- Hoistman
- Hydraulic monitor operator
- Industrial-locomotive engineer
- Loader, Machine
- Machinist, Maintenance
- Maintenance, mechanic
- Manager, Mining
- Manager, Personnel
- Master mechanic, Maintenance
- Mechanical engineer
- Metallurgist
- Millman (A general term for special operators engaged in the operation and adjustment of milling or ore dressing equipment. This title des not include helpers or mill laborers.)
- Mine captain
- Mine motorman
- Miner (all-around)
- Mining engineer
- Ore grader
- Pipe fitter, Maintenance
- Power-house engineer
- Power-shovel or dragline operator
- Production checker
- Pumpman
- Purchasing agent
- Rotary driller
- Shaft repairman
- Shift boss
- Slusher operator
- Sulphur station operator
- Superintendent, Surveyor, Mine
- Switchboard operator (power-house)
- Timberman
- Tool dresser
- Tracklayer
- Track-moving-machine operator
- Tractor or truck mechanic
- Undercutter
- Welder, Arc or Acetylene
- Safety engineer

STONE PRODUCERS' MRO RATING CHANGED.—The War Production Board has issued Amendment 1 to Interpretation 1 of Preference Rating Order P-56 as amended, effective November 13. The purpose of this Interpretation is to clarify the MRO status of stone manufacturers under CMP Regulation 5. Under the interpretation persons engaged in the manufacture of tombstones and monuments at a plant separate from the quarry will use an AA-5 rating, while manufacturers of structural stone at a plant separate from the quarry will use an AA-2 rating.

The second Army-Navy "E" white star award for continued production excellence has been issued to the Traylor Engineering & Manufacturing Company and to the Independent Pneumatic Tool Company.

Keep 'Em Flying — Keep on Buying War Bonds

Old Edison Cement Plant Now Comes to the Aid of Chile

Equipment Rebuilt and Installed at Juan Soldado; Four 199-Foot Kilns Made from 8 Shorter Units

THE newest wet-process cement plant in South America, and the second one to be built in Chile, is now under construction at Juan Soldado which is 5 to 6 miles from Coquimbo. The supply of cement in Chile has been pretty well limited to its national production, imports as a general rule being negligible. To-day practically all the production is derived from the only cement plant, known as Sociedad Fabrica de Cemento El Melon.

In view of the general cement situation in Chile, late in 1941 the Corporacion de Fomento de la Produccion, in its official capacity as an instrumentality of the Chilean government, decided upon the construction of a plant, which would produce approximately 250,000 tons of cement per annum, in the vicinity of Coquimbo.

The financing of the project, estimated to require a total investment of 90,000,000 Chilean pesos ($3,000,000 U. S. currency), was to be effected by means of private capital subscribed in Chile, plus whatever financial assistance might be procured in the United States through the medium of the Corporacion de Fomento's existing credit agreement with the Export-Import Bank of Washington.

By M. AGOSIN

Chief Engineer, Industrial Division, Corporacion de Fomento de la Produccion

Subsequently the Corporacion de Fomento de la Produccion approved and authorized its wholly-owned American subsidiary, the Chilean Trading Corporation, to acquire and ship to Chile all the machinery necessary for the construction of the projected Coquimbo plant which was not available in Chile. This represented an expenditure of approximately $1,900,000, about 65 per cent. of the total capital investment.

Because of the many uncertain and difficult conditions encountered to-day with respect to the manufacture and delivery of heavy machinery and equipment, some arrangements were made to insure as prompt delivery as possible to Chile. These arrangements can be listed chronologically as follows:

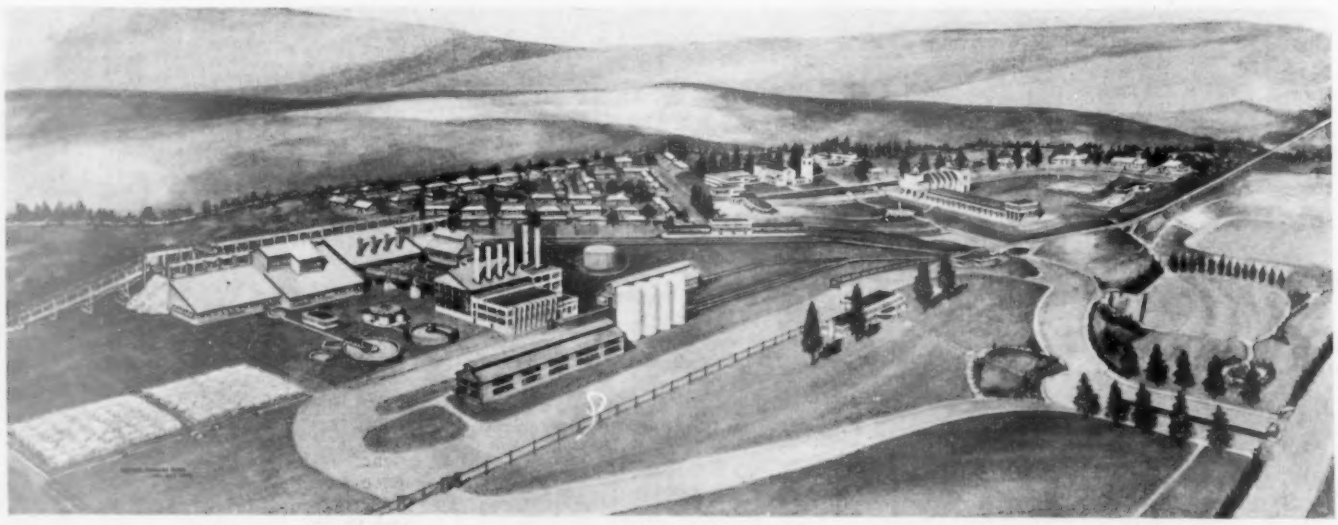
At the end of 1941 Chilean Trading Corporation purchased a whole non-producing property located at Piscataway, New Jersey, belonging to Thomas A. Edison, Inc. Eight 8- by 125-ft. unused rotary kilns of Vulcan make were acquired in this transaction and were transformed to four 9½- by 8- by 199-ft. kilns to be installed in the new plant.

Due in great measure to the inability to procure all the new material in the United States, the Chilean Trading Corporation entered into an agreement with the Edison Cement Corporation for the purchase of its complete cement plant located in New Village, New Jersey.

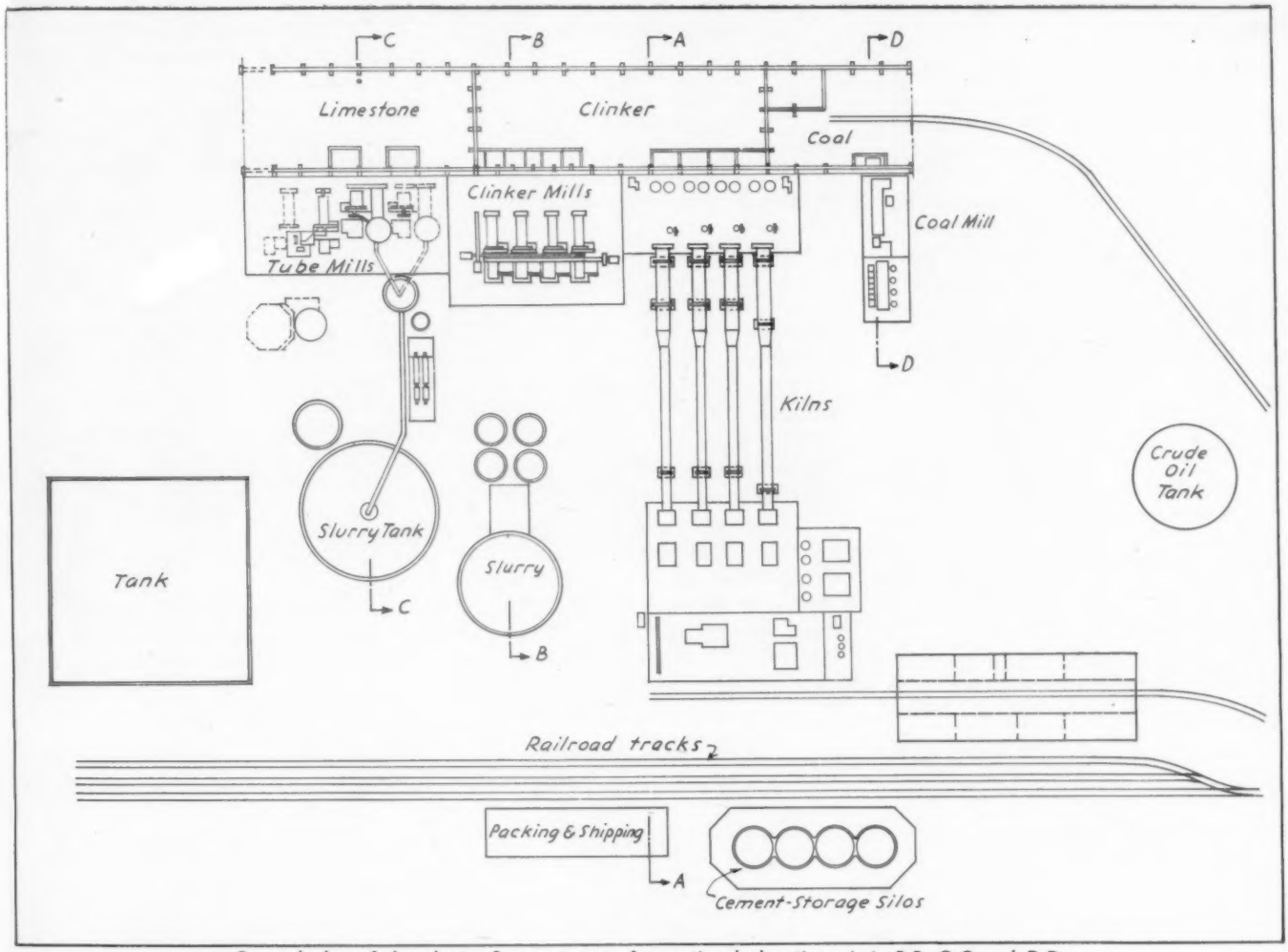
Export licenses, releases and priorities were granted to complete the equipment acquired from these two plants. The main items of this new equipment were the flotation plant, ball-mill, traveling crane, coolers, buildings, etc. Priority ratings were also granted to recondition the kilns in the shops of the Vulcan Iron Works, and to repair the miscellaneous equipment acquired in the New Village purchase.

Quarry A few miles north of Coquimbo, located just south of the arid zone where the average annual rainfall is about 6 inches, is found a large deposit of conglomerated shells of marine origin.

This raw material extends in two terraces in layers over 3 miles long and from 10 to 40 feet thick. The overburden on these layers varies considerably and consists principally of loose sand.



Artist's conception of the Joan Soldado plant. Housing development in background; spray pond for power-plant cooling water at left.



General plan of the plant. See next page for sectional elevations A-A, B-B, C-C and D-D.

Examination of this deposit indicates an analysis of approximately 60 per cent. $CaCO_3$ and about 30 per cent. SiO_2 and about 6 per cent. $Al_2O_3 + Fe_2O_3$. The deposit comprises at least 15,000,000 tons of this material. By proper beneficiation this deposit forms excellent raw materials for cement manufacture.

In spite of the arid nature of this section, there is an abundant water supply available from the Coquimbo River draining the Andes, part of which is diverted through irrigation canals above the deposit.

An ideal level plant site is found between the deposit and the Pacific Ocean, making the conditions for raw-material transportation very attractive. Furthermore, the longitudinal highway in Chile, paralleling the coast, runs adjacent to the plant site, and the railway from Santiago to Coquimbo extends to the plant site, thus creating favorable conditions for shipment of cement both by railway and highway.

The port of Coquimbo will also offer favorable conditions for the shipment of cement by water. In this connection, due to the proximity of the sea which is about one mile distant, the construction of proper landing facilities in front of the plant is under consideration.

Raw-Material Handling The raw materials, after having been blasted, will be loaded by means of a Number 480 Marion electric shovel into 10-cubic yard Easton semi-trailers drawn by Ford tractors. It is but a short distance to the crushing plant where they will be discharged by means of an Easton pneumatic car-tipper. Inasmuch as the silica in the raw material to a great extent consists of fine sand, the inlet hoppers to the crusheers are provided with grizzlies for segregating the minus-3-inch material which, by means of a bucket-elevator, is passed over 5- by 12-ft. Kennedy-Van Saun double-deck vibrating screens provided with ¼-inch mesh screens on their lower decks and driven by 10-horsepower Star motors. The fines, consisting principally of sand, are taken by a belt-conveyor to two steel bins for removal by truck as occasion requires.

The major portion of the rock passing over the inlet-hopper grizzly is fed by means of a 36-inch by 15-foot Chain Belt apron feeder to a Number 3650 Dixie hammer-mill driven by a 200-horsepower Westinghouse motor. The oversize from the vibrating screen is likewise delivered to the hammer-mill.

Space is provided in the crushing plant for the installation at a later date of an additional Dixie hammer-mill which will be of the non-clogging type.

The raw materials discharged from the hammer-mill are delivered to a 30-inch wide by 315-foot inclined belt-conveyor discharging into the raw-material storage.

The storage building is served by a P & H 9-ton 3½-cubic-yard clamshell 4-motor overhead crane.

The raw-material and clinker storage is 75 feet wide and 484 feet long. The rock storage is 154 feet long. The clinker storage is 220 feet long and the coal and gypsum storage 110 feet in length.

The crane runway on one side of the storage is supported on structural-steel A-frames, whereas on the side adjacent to the plant proper a reinforced-concrete retaining wall is provided and serves as a support for

the crane runway on this side of the storage.

Flotation The processing of the raw materials was engineered by the Separation Process Company in collaboration with F. L. Smidth & Company.

A complete study of the quarry deposit indicated sufficient raw materials for operation over a good many years. The average analysis of the raw material is as follows:

SiO_2	32.50 per cent.
Al_2O_3	7.72 per cent.
Fe_2O_3	1.48 per cent.
$CaCO_3$	55.98 per cent.
$MgCO_3$	1.08 per cent.
Loss	23.68 per cent.
Total	97.24 per cent.
SiO_2/R_2O_3	3.53 per cent.

Flotation tests on these samples indicated that the material could very readily be processed and that any desired composition could be produced from the deposit.

The diagrammatic flow sheet illustrates the flow of material through the raw-grinding circuit, flotation process and blending circuit.

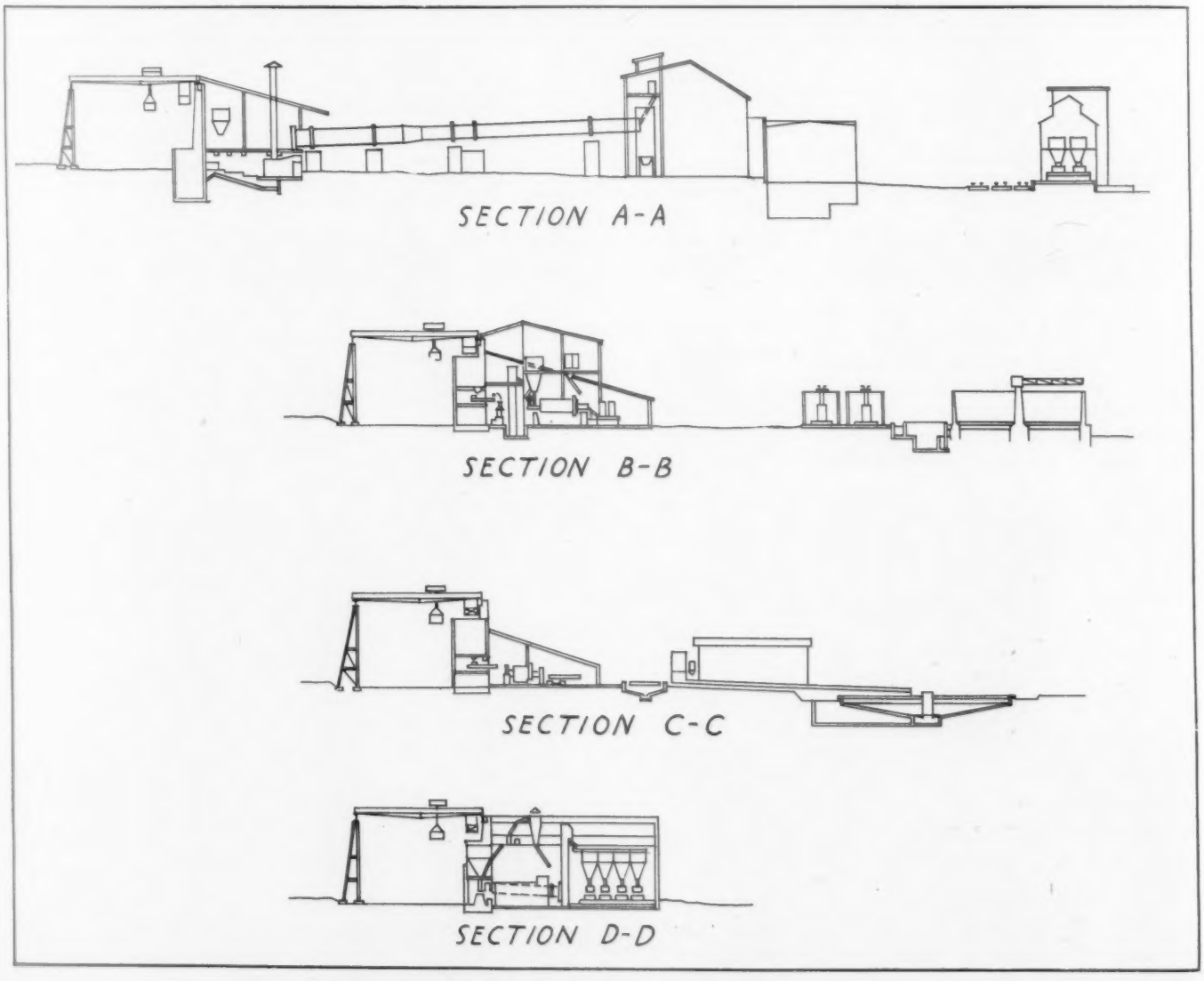
Raw Grinding As illustrated, the raw material, after being quarried and crushed, is delivered to an F. L. Smidth 9½-foot by 10-foot 8-inch ball-mill, connected through a V-belt drive to a 500-horsepower Westinghouse motor, which grinds the rock in closed circuit to minus-65-mesh. A 9-foot FX Dorr bowl classifier is used in conjunction with the ball-mill in this preliminary step. From here the overflow of the classifier (minus-65-mesh) flows by gravity into a 25-foot Dorr hydroseparator.

The classification made in the hydroseparator is, roughly, on the basis of 325-mesh, as it has been found by testing that the minus-325-mesh matrix increases in lime approximately 16 points and also has a lower ratio than the original head sample. In view of this, this material is taken off as a hydroseparator overflow and flows by gravity into the 100-foot Dorr thickener where it is thickened. This portion of the material is not treated further.

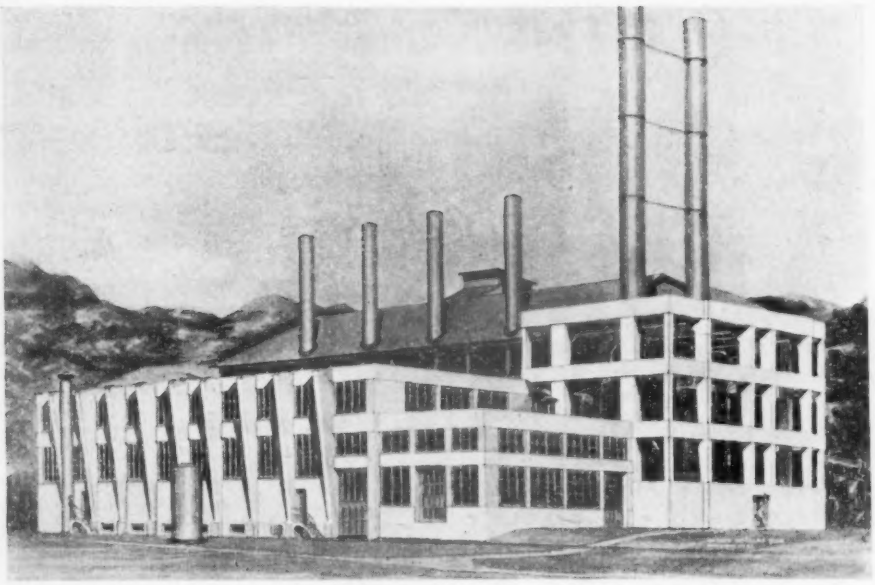
The underflow of the hydroseparator is withdrawn to a turbomixer, where the material is collected previously to feeding it to the flotation cells. This unit is used to obtain a constant feed for the flotation units following.

From here the slurry is to be fed at 30 per cent. solids to two rows of Fagergren flotation machines, each row consisting of six 56-inch cells. These machines are manufactured by the American Cyanamid Company. In them the coarse silica and alumina are discarded in the form of a reject. The high-lime concentrates taken from the cells flow by gravity into the 100-foot thickener, where they are blended together with the hydroseparator overflow.

Below is given a table illustrating the percentage weights and the analyses of the various products



Elevations through burning, grinding and coal departments.



Rigid-frame reinforced-concrete power-house and the waste-heat-boiler plant behind it.

produced in the process of classification and flotation:

	Hydro-separator Overflow	Concentrate	Thickener Underflow	Reject
Percentage Weight	20.4	49.8	70.2	29.8
SiO_2	20.00	14.44	16.10	69.70
Al_2O_3	5.29	3.09	3.75	15.25
Fe_2O_3	1.23	1.49	1.41	2.39
$CaCO_3$	71.82	80.36	77.80	8.14
$MgCO_3$	1.40	1.11	1.19	1.21
Loss	30.97	34.98	33.74	1.63
Total	98.38	99.53	99.15	94.11
SiO_2/R_2O_3	3.06	3.15	3.12	3.95
Titration	70.0	79.0	76.3	2.7

The thickener underflow, as shown above, will approximate 77.8 per cent. lime. It will be remembered, of course, that this can be held at any point desirable between 75 and 95 per cent. simply by the control of the various products going to the thickener. The fineness of the underflow will approximate 70 per cent. minus-200-mesh and will be withdrawn from the thickener at approximately 66 per cent. solids.

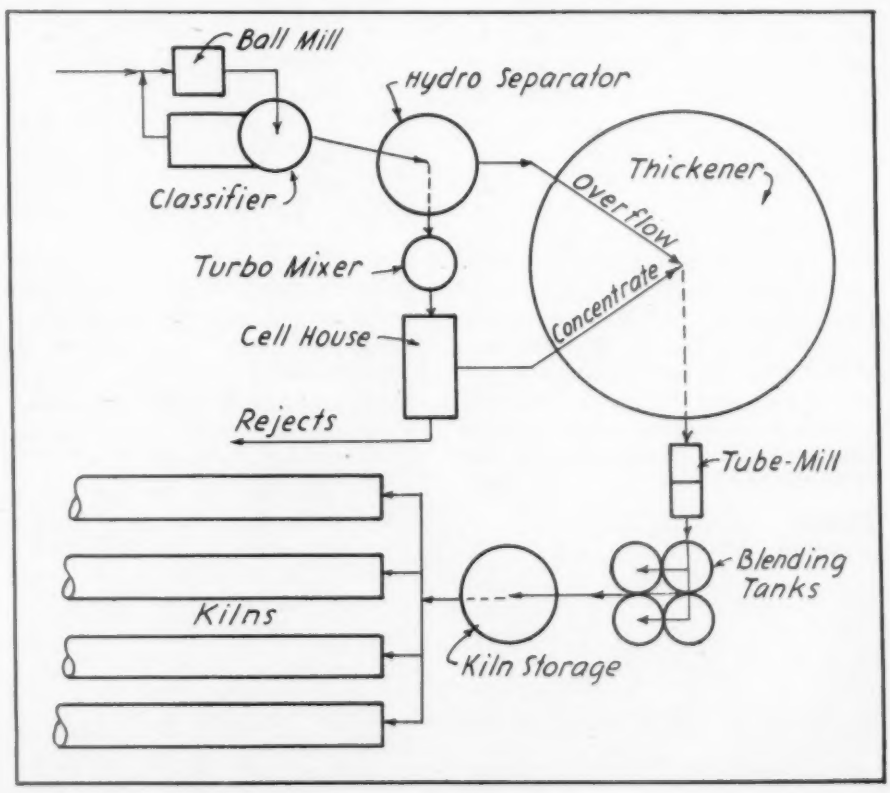
From the thickener underflow the slurry will be pumped to a 7- by 24-foot tube-mill, connected through V-belt drive to a 450-horsepower Westinghouse motor, which will complete the raw grinding, reducing to approximately 93 per cent. minus-200-mesh. If it should be desirable to add clay or iron, these materials will be brought in at this step of the process. An alternative makes possible the filling of one of the blending tanks with either of the above-mentioned materials and blending them into the product after the secondary raw-grinding step.

From the raw mills the slurry is pumped, by means of Wilfley pumps, to four 20- by 20-foot Dorr mechanically agitated slurry tanks where the blending is completed. From here the prepared mix is pumped to one 80-foot diameter F. L. Smidth cylindrical storage tank, which is used for prepared kiln feed.

All the equipment in the flotation system has been supplied by the Separation Process Company. The thickener and the units built of concrete have been designed for a capacity of 4,000 barrels per day, while the cell-house has been designed for 3,000 barrels, which is the intended capacity at the time of starting the plant. The engineering has been detailed for the expansion to 4,000 barrels at a future date.

The advantage of this two-step grinding of the raw material is very apparent in processing a material this low in lime, where the material discarded to make a mix approximates 30 per cent. of the total weight. The preliminary grinding step is made at a very coarse grind and, as a result, a considerable saving in power is realized by not grinding to extreme fineness material which is to be discarded later in the form of rejects. The final grinding is then completed on the high-lime slurry.

It is to be noted that one of the advantages of hydroseparation before flotation is that the hydroseparator classifies out the fine siliceous material, which is to be retained in the slurry for the purpose of producing a mix, and that the rejects discarded in the flotation operations is the



coarsest siliceous material produced from the preliminary-grinding step.

Burning At the feed end of the kiln is located a slurry distributor delivering the slurry to each of the 4 F. L. Smidth scoop-type slurry feeders which are arranged for operation in synchronism with the kiln speed by means of alternating-current generators connected to the kiln drive supplying the current for the motors which operate the kiln feeders through speed-reducers and chain drives.

There are four 9½- by 8- by 199-foot 4-tire Vulcan kilns operated by 75-horsepower Westinghouse motors. The kiln gases are discharged to waste-heat boilers, one for each kiln.

For each kiln there is installed a 4- by 16-foot Fuller grate cooler which discharges the clinker on 16-inch by 40-foot inclined drag-chain conveyors delivering the clinker to pits in the storage building where it is distributed by means of the overhead traveling crane.

In order to obtain the most economical operation of the kilns, dual firing equipment is provided so that either oil or coal may be used.

The oil-firing system is of the high-pressure mechanical-atomization type supplied by F. L. Smidth, and each kiln is provided with duplex pumps, heaters and strainers so as to assure uninterrupted service.

The coal-preparation equipment is housed in a separate building and consists of a 5½- by 42-foot Fuller rotary drier and four 46-inch Fuller mills operated by means of 100-horsepower General Electric motors.

A 6-inch Fuller-Kinyon pump delivers the pulverized coal to two coal-feed bins for each kiln, below which are installed 6-inch coal-feed screws.

For each of the kilns there is a centralized control panel on which are located indicating ammeters for the kiln and the primary air-blower, as well as a kiln-speed indicator. Furthermore, there are draft gages for the kiln and the Fuller cooler, a recording pyrometer and control switches for the kiln motor, and all the auxiliaries.

Clinker Grinding In the clinker mill are installed two Number 19½ Kennedy-Van Saun gyratory crushers operated by 30-horsepower Star motors as preliminary grinders. Each of these crushers is fed by two 20-inch Schaffer poidometers, one for clinker and one for gypsum.

The granulated clinker is delivered by elevators to four 7- by 24-foot two-compartment mills operated by 450-horsepower Westinghouse motors through V-belt drives.

There are two 14-foot Sturtevant separators, and by means of screw-conveyors and elevators it is possible to operate each set of two tube-mills in conjunction with the air-separators. In this manner a very flexible and efficient installation is obtained whereby either straight grinding may be performed or, when desired, high-surface-area cement may be produced by operating the air-separators.

When producing normal cement the output of the clinker mill is conveyed by means of an 8-inch Fuller-Kinyon pump to the storage silos, whereas when producing high-surface-area cement the output of the clinker mill is transferred by means of a 6-inch Fuller-Kinyon pump.

It is entirely feasible to operate one-half of the clinker-mill installation on normal cement and simultaneously produce high-surface-area cement in the other half of the clinker-mill installation.

A 5-section continuous type Sly dust-arrester is installed and connected to the several units of the clinker mill so as to insure cleanliness in the plant.

Storage and Packing For the initial operation there are 4 silos, 30 feet in diameter by 40 feet high. The height of the silos is limited due to relatively low carrying capacity of the soil, as well as a safeguard against damage due to the frequent seismic disturbances occurring in Chile.

Below the silos is a 10-inch portable Fuller-Kinyon pump for conveying the cement to the packhouse, in which there are four 3-spout Bates packers.

In front of each two of the packers are loading belts arranged for discharge on one side of the packhouse to railroad cars and on the opposite side to trucks.

A 3-compartment Sly dust-collector is installed to insure cleanliness in this part of the plant.

The cement will be packed in paper sacks, and a large storage is provided in the pack-house for empty sacks, as well as for packed cement. In the pack-house is a Speidel freight elevator for handling paper sacks to the storage area, as well as to the floor above the packer operators' platforms so as to facilitate the delivery of empty sacks to the packers.

Power Plant The purchase by Fomento of the plants of the Edison Cement Corporation, in addition to securing excellent cement-mill equipment, provided boilers, turbines, switchgear and power-plant auxiliaries of outstanding quality. Thomas A. Edison, the inventor of much of the equipment and apparatus used for the generation of electricity, appreciated high-grade equipment and installed it at his cement mill at New Village. The power-plant for the Juan Soldado cement mill will include 4 Babcock & Wilcox waste-heat boilers of the wrought-steel sectional-header type, each directly connected to the hot-gas discharge from one of the four cement kilns and two direct-fired boilers designed to burn Chilean coal in pulverized form or fuel oil, whichever fuel is available at the most advantageous price.

Under normal conditions of cement-mill operation the steam generated in the 4 waste-heat boilers will be sufficient to generate all the electricity required to operate the cement mill.

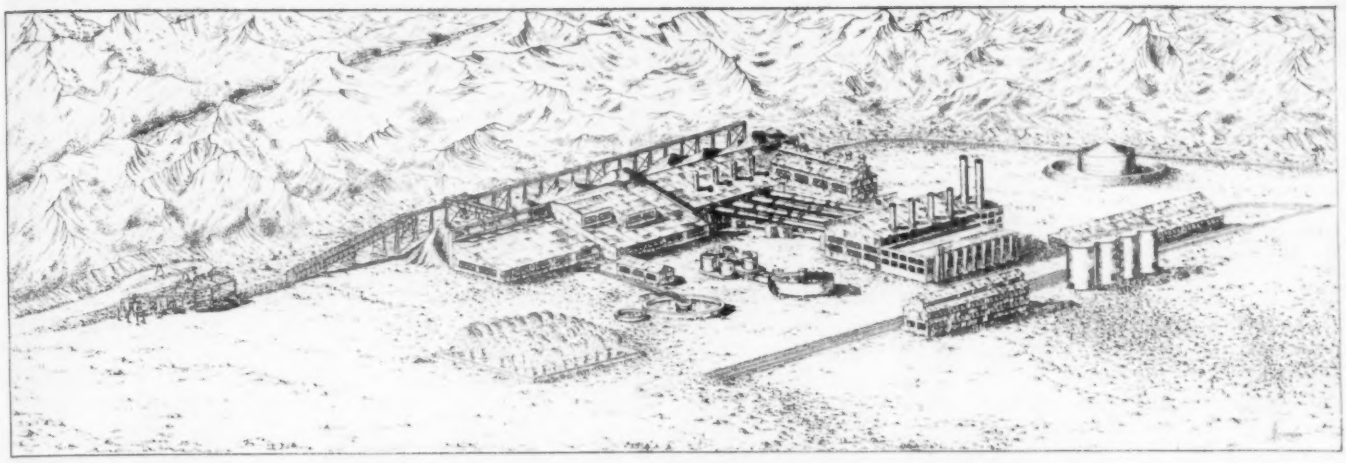
The two direct-fired boilers are available to supply steam when initiating cement-mill operations and whenever one or more of the cement kilns may be idle. The direct-fired boilers will also supply steam to generate electricity beyond the requirements of the cement mill for distribution to other users of electricity in the Coquimbo area.

The waste-heat boiler-plant is housed in a steel structure transferred from New Village. The direct-fired boilers are inclosed by a reinforced-concrete structure with open panels in the side walls for ventilation and light.

The turbine-house is of reinforced concrete where the rigid-frame principle has been applied, resulting in a building of unusual appearance. Adjoining this is a lower structure housing the boiler-feed pumps, service-water pumps, feed-water heater, fuel-oil pumps and heaters and miscellaneous equipment. In this structure is also located a toilet and locker room for the operating force.

The turbine-house and the adjoining auxiliary building are both inclosed, windows taking the place of the open panels in the boiler-houses.

The gases leaving the boilers pass through Buell dust-collectors before entering the economizers. These dust-collectors are of modern design, having been in service for only about a year in New Village. Their installation is a refinement not usually found in a South American cement-



Pen-and-ink sketch of the plant. Community to house workers will be located in hills in background.

mill power-house and should result in practically dust-free operation at Juan Soldado.

The economizers through which the gases pass after leaving the dust-collectors are of cast-iron construction. The gases in passing through the economizer give up heat to the feed-water before it enters the boiler, thus extracting all the usable heat in the gases before they enter the induced-draft fans from which they are discharged to the atmosphere.

A complete system of dust-collecting hoppers is provided under the waste-heat boilers and the flue-gas dust-collectors from which conveyors deliver the dust back to the cement mill to be made into cement.

The waste-heat boiler-plant at Juan Soldado will save about 22,000 metric tons of Chilean coal per year that would be required for 300 days' operation of the cement mill were no waste-heat boilers installed and the steam generated in direct-fired boilers.

The two direct-fired boilers are also of the Babcock & Wilcox wrought - steel sectional - header design. In the Edison plant these boilers were served by underfeed stokers, but Chilean coal does not lend itself to the use of this type of stoker. Since it was desirable to provide a furnace suitable for burning either Chilean coal or fuel oil and a pulverizing plant was being installed to supply powdered coal for the cement kilns, furnaces were designed under these boilers of ample capacity for either pulverized coal or fuel oil. This necessitated raising the boilers to increase the furnace volume. These furnaces are designed with air-cooled bottoms under which the forced blast air is blown by turbine-driven fans located above the boilers.

A hydraulic system for sluicing ash when burning pulverized coal simplifies the ash-disposal problem.

The turbine operates at 1,500 r.p.m. rather than at 3,000 r.p.m. which is almost the universal speed in 50-cycle turbines.

The power-plant was designed by Baker & Spencer, Inc.

Water Supply An unusual provision has been made to secure continuous operation of the boilers by a careful preparation of the boiler-feed water. An evaporating plant is being installed to provide distilled water, the theory being that if only pure water is supplied the boilers, no scale will be formed on the interior surfaces and the boilers can be kept in service indefinitely. This is in accordance with the most modern practice of boiler operation and is seldom found outside the large central stations. As a further precaution, and to eliminate the formation of scale in the evaporator, the water taken from the irrigation ditch above the plant receives a pretreatment in a Permutit water-treating system.

To insure the maintenance of proper feed-water conditions in the boilers during operation of the plant, Fomento has entered into a contract with the Hall Laboratories for continued supervision through the medium of water samples and chemical reports on the conditions obtaining. This is the service subscribed to by the Chile Exploration Company for its Tocopilla plant and for other large plants in Chile.

Electrical Equipment Electricity will be produced by a General Electric turbo-generator with an original rating of 12,500 kilowatts when delivering 60-cycle current at 2,300 volts. After acquiring 60-cycle equipment with the Edison plants, Fomento was faced with the important decision of following the path of least resistance and reinstalling it in Chile with no change, or of making the technical changes required for a 50-cycle installation. The latter course was adopted, enabling this plant to operate in parallel with the existing and projected 50-cycle plants in the Coquimbo area without the loss inherent in frequency-changing equipment, which loss averages about 20 per cent. In line with this decision this unit has been modified and the generator reconnected by the General Electric Company for 50-cycle operation and is now rated at 10,500 kilowatts.

This turbine exhausts into a surface condenser with cooling water supplied by means of a spray pond. Coquimbo River water, taken from the irrigation canal above the plant site is used in this system.

In the turbine room is located an Ingersoll-Rand air-compressor having a capacity of 3,600 c.f.m. and driven by a 600-horsepower synchronous motor. This motor, like all other alternating-current equipment at the Edison Plant, as already mentioned, was designed for 60-cycle current. A new field has been supplied by the General Electric Company and the stator has been reconnected for operation in Chile on the 50-cycle system. This large synchronous motor will have a beneficial effect on the power factor of the plant.

An auxiliary air - compressor of 750-c.f.m. capacity is also located in the turbine room. The large compressor will supply the normal requirements of the cement mill when operating at full capacity with the small compressor as a reserve unit.

Two motor-generator sets are also located in the turbine room to provide reserve excitation for the main generating unit as well as current for a few small direct-current motors,

(*Continued on page* 62)

"Maintain Manpower" Keynote of Industrial-Hygiene Sessions

DELEGATES from all over the country became so interested in sessions of the eighth annual meeting, Industrial Hygiene Foundation, Mellon Institute, Pittsburgh, Pennsylvania, November 10 to 11, that they stayed on until the very last, John F. McMahon, managing director, told PIT AND QUARRY'S representative.

At least 543 persons packed the meetings to capacity. The theme of the meetings was "Maintain Manpower."

The keynote address by Charles F. Kettering, vice-president, General Motors Corporation, emphasized the truth that the better the working conditions the better the workman's point-of-view and, therefore, the better the production. Changing one's routine, said Mr. Kettering, is a big reason for accidents: change routines intelligently. Don't be afraid to change your mind. . . . Fail intelligently and you have a better chance of success. Mr. Kettering said: (1) the common cold is our greatest manpower problem, (2) workers underestimate its seriousness, (3) probably its cure is simpler than we imagine.

The meeting's medical section included a progress report on disability in silicotics and a report on health hazards.

Discussing health hazards, "A good industrial health and hygiene program," said Lt.-Col. W. J. Connell, M. C., Safety and Security Branch, U. S. Army, comprises "the diagnosis and treatment of minor ailments of employees, medical supervision of plant hygiene and sanitation, immunization of workers against communicable diseases which are preventable, supervision of plant cafeterias, a planned program of employer health and safety education, maintenance of accurate individual sick records that can be easily tabulated and studied to detect and control excessive illness."

In the next address Surgeon R. H. Flinn, U. S. Public Health Service, U. S. Army, said, "Our new ordnance plants' industrial hygiene program and medical facilities are second to none, and most of [their] features are adaptable to American industry generally." First, a careful physical examination, said Dr. Flinn, "impresses the worker that his health and physical capabilities are being considered and allays nervousness and apprehension often associated with" his work. "The periodic physical check-up and careful medical supervision have been of inestimable value in controlling occupational diseases," Mr. Flinn continued.

"The health program functions better in large plants when the industrial physician tours all the operations at frequent intervals. Here he learns to know the employees at work, the nature of their jobs, sanitary and hygienic provisions and practices or their lack."

There should be friendly coöperation between the plant physician and the private physicians in the community, Mr. Flinn continued. Employees look to their private physicians for medical advice. "If the private physicians are wholly unfamiliar with the plant processes and health hazards, they may be in a real quandary as to the truth of the matter when their patients allege the work is injuring their health. Physicians are encouraged to visit the plant, observe the operations, discuss the nature and methods of control of occupational diseases in the plant, and to consult with the plant doctors regarding troublesome cases."

No improvement in performance of three miners afflicted (in various stages) with silicosis after treatment with powdered hydroxide of aluminum was reported by Dr. L. U. Gardner and Dr. George Wright, The Saranac (N. Y.) Laboratory.

All the miners tested were young, working, had neither symptoms nor complaints. Their examination required three days. After both the first and second series of 50 treatments for one miner, his individual performance remained the same.

Knowing one has silicosis can produce "profound psychological disability," said the speaker. "Treatment can eliminate this reaction entirely, but not materially decrease the functional disability. Aluminum therapy will rarely, if ever, result in much alteration of functional measurements."

The maintenance of women in industry was discussed Thursday morning. "Women will continue to be used in greater numbers in industry to demonstrate their value both in war and in peace," said Dr. C. C. Sappington, industrial health consultant of Chicago, following a 10,000-mile tour of plants to determine the physiological problems of women. His survey covered 54 plants employing 452,000 persons; 131,000 were women. Individual plants, located in 14 industrial areas in 10 east, southeast and midwestern states, employed from 320 to 25,000 persons, the range being 2,000 to 10,000 persons.

Dysmenorrhea was not significant. Most plants do not hire pregnant women, allowing six-months' leave of absence. When women do not admit they are pregnant, it is difficult to tell by the customary physical examination. The menopause in most plants presented no problem. Pelvic examinations were not made by most physicians. The most frequent and most difficult problem is married women with children who couldn't hold down both their job at home and service at the plant. Lack of proper rest and recreation resulted in "frank fatigue". Most communities do not have day nurseries, and domestics and relatives are unsatisfactory.

"It may be necessary, if the problem becomes acute," said Dr. Sappington, "to restrict the employment of married women to those who have no children under 14, as has been done in Great Britain." Some small plants in small communities reported an "epidemic" of women wanting to change jobs.

"Personnel problems always were better controlled," Dr. Sappington concluded, "in plants where there was well-managed supervision."

The discussion section on the health problems of women in industry featured Mrs. Warwick B. Hobart, Advisor on Employment of Women, Office of Secretary of War in Washington, who declared: "Health factors present the primary difficulties in the employment of women." Ill-health and home responsibilities at present, said Mrs. Hobart, are considerably higher for women than for men and are most responsible for "terminations and absences." The employment of pregnant women presents very serious difficulties, said Mrs. Hobart, "largely because management has not yet seen fit to enunciate clear-cut policies which would permit pregnant women to work at suitable jobs, but rather has taken the position that employment should be terminated. It is going to become imperative that we devise policies allowing pregnant women to work at suitable occupations during the major portion of

(*Continued on page* 60)

Mounting War-Time Production Difficulties Aired by NISA

A MEETING of exceptional interest and importance was held by members of the National Industrial Sand Association in New York on November 9. Many problems of special importance at this time were discussed and the progress made in the investigation of others was reported to those present.

Edward W. Bauman, retiring chief of the War Production Board's Non-Metallics Section of the Mining Equipment Division, reviewed briefly some of the changes that have recently taken place in the procedures followed by the Mining Division. Until recently the quota assignments given to mines under the MRO have been based on quarters, but beginning the first of 1944 they will be for six-month periods. The estimates made for the first quarter, both CMP and dollar-value, will carry over for the second quarter. He introduced James E. Bacon, who succeeds him in the WPB.

Mr. Bacon gave those present some suggestions for their operation under existing priority regulations. For plants not operating with mine serial numbers the available priority preference rating for repair and maintenance items has been raised from A-2 to AA-5. He said, in explaining some of the delays which producers experience in their efforts to get repair parts quickly, that all orders for parts must take their turn on the production schedules of the machinery man. ufacturers who make them regardless of the rating they carry. To alleviate the situation the WPB will furnish producers with the names of manufacturers who can furnish the needed parts or materials.

Many producers have been asking for a new equipment rating of AA-1 because their suppliers have said that that rating is necessary, but they should make certain that it is absolutely needed before using it, because the use of an unnecessarily high rating delays the handling of the requests. The WPB will make contact with the suppliers, if necessary to get the needed parts. Applications should be made on the 2910 form.

Executive Secretary V. P. Ahearn said that Limitation Order L-41 grants exemption from its restrictions for construction done in connection with the discovery, development or depletion of mine deposits. The type of construction for which exemption is expected must fall within that description.

Mr. Ahearn then presented a review of the compensation-insurance situation. In answer to protests against the arbitrary policy of rate-making followed by the compensation-insurance companies in the past, the National Council on Compensation Insurance has admitted that there are no actuarial bases for the present compensation rates (see PIT AND QUARRY, July, 1943, pages 48 and 121), which are excessive and unwarranted. The actuarial committee of the council recommends that application for changes be made in industrial states having workmen's compensation laws. The committee seemed to take a favorable attitude toward the industrial-sand industry's complaint about rates. The fight for a reduction in the rates now in effect has been going on for years. The excessive rates and the unwillingness of the insurance companies to place them on an actuarial basis are forcing producers to adopt the policy of self-insurance, as in West Virginia, where the O. D. (occupational-disease) rate is $6 per $100 of payroll.

On the subject of manpower losses due to the drafting of workers, Mr. Ahearn pointed out that the industrial-sand industry is specifically mentioned in Bulletin 11 of the Selective Service System, but the men for whom exemption is sought must be engaged in essential occupations. He advised producers to investigate the draft status of every male employee under 38 years of age and, if he is an essential worker, to make application for deferment immediately on Form 42-B.

A number of members present reported on the draft situation in their plants. One Illinois producer lost 2 or 3 important workers and was asked to file a Manning Table. Competition of a Navy plant has caused difficulty. Six-month deferments have been granted but there have been no permanent deferments and no reclassifications.

A producer in Ohio said that he had found local draft boards fair and considerate. Arguments for deferment are required to be made in writing.

A Michigan producer reported the loss of a few important men, and a similar experience was related by a producer from New Jersey.

A New Jersey member said that his local draft board does not consider Form 42-B valid and that Form 42-A replaces it.

With respect to what many have considered to be an unsympathetic attitude on the part of draft boards to employers' pleas for deferments, Mr. Ahearn called attention to the fact that the Selective Service System assumes that a new man can be trained within 6 months to replace any worker. That presumption may be overcome by the submittal of evidence to the contrary.

One of the members present said that he had adopted the policy of refusing certificates of availability to men who wanted to leave his employ for other jobs and of making agreements with all new employees that no such certificates would be issued to them if they should decide to leave. Mr. Ahearn remarked at this point that the rule requiring 30 days inactivity on the part of a worker between leaving one job without a certificate and taking another job has been amended to require 60 days of intervening unemployment.

Mr. Ahearn explained that men employed in critical jobs, however, can not lay off 60 days before taking new jobs.

The loss of male workers has naturally forced employers to consider the possible use of women as substitutes. One producer reported the employment of women on trucks but this was not permitted by state laws covering the employment of women. Their use on delivery trucks was approved but not that on dump trucks. Another producer reported the use of a woman as an overhead crane operator by a Navy contractor.

With respect to prices, Mr. Ahearn reminded his hearers that the General Maximum Price Regulation covers industrial sand and was amended by Price Regulation 188. According to findings of the Economic Section of the Office of Price Administration, the average price of molding sand has risen materially since 1941. This price was taken by the Economic Section from a report of the United States Bureau of Mines. The OPA has asked a number of producers for data on their production of molding sand by dollar volume for 1941, 1942 and 1943 (9 months) and for their prices and other information. The Bureau of Mines report shows that molding-sand prices, on the average, rose 10½ cents a ton above that of 1940 to $1.16, and it estimates that the 1942

average price was $1.32. The averages were arrived at by dividing the industry's total reported dollar value of sales by its total production in tons. No account was taken of such important cost factors as grades, etc.

There was also some discussion of the question of percentage for depletion of deposits in the computation of corporation income-tax liability and reference was made to the fact that the Treasury Department has made flat percentage allowances to entire industries, as in the cases of coal and petroleum.

Mr. Ahearn reported that although the Treasury Department has favored abolition of the 3 per cent. tax on transportation it has been restored to the tax bill now pending in the House of Representatives, but may be stopped in the Senate.

The supply of railway cars, according to Mr. Ahearn, is relatively good, but the condition of the cars available has deteriorated. There are no priorities on car supplies and none are in prospect.

The fear of renegotiation has no terrors for the industrial-sand industry. By a joint statement issued by the Army, Navy, Maritime Commission, etc., the production of "washed or screened" sand is exempted from the provisions of renegotiation.

The following members, officers and guests were in attendance at the meeting:

V. P. Ahern, executive secretary, National Industrial Sand Assn., Washington, D. C.
H. Allport, Standard Silica Corp., Chicago.
James E. Bacon, War Production Board, Washington, D. C.
E. W. Bauman, War Production Board, Washington, D. C.
Donald Baur, Albany Sand & Supply, Albany, N. Y.
Wilbert Bivins, National Pulverizing Co., Millville, N. J.
J. J. Cleary, Oneida Lake Sand Mines, Cleveland
J. S. Cable, Minnesota Mining & Mfg. Co., Akron, O.
J. A. Crew, Ayer Minerals Co., Zanesville, O.
E. H. Daugherty, Taggart & Co., Philadelphia
Louis Dill, George F. Pettinos, Inc., Philadelphia
E. M. Durstine, Keener Sand & Clay Co., Columbus, O.
Sterling Farmer, Sand Products Corp., Cleveland, O.
P. G. Forman, Industrial Silica Corp., Youngstown, O.
A. Y. Gregory, Whitehead Bros. Co., New York City
L. M. Hansen, Industrial Silica Corp., Youngstown, O.
R. G. Hay, Ayers Mineral Co., Zanesville, O.
C. Mathiesen, Whitehead Bros. Co., Albany, N. Y.
T. C. Matthews, Penn Glass Sand Corp., Lewistown, Pa.
Alfred J. Miller, Whitehead Bros. Co., New York City
P. W. Palmer, Browntown Silica Co., Browntown, Wis.
Stanley A. Phillips, PIT AND QUARRY, Chicago
A. B. Schlesinger, New Jersey Pulverizing Co., New York City
E. O. Schneider, Ottawa Silica Co., Ottawa, Ill.
Wm. Sherralt, South Jersey Sand Co., Dividing Creek, N. J.
Harry F. Spier, New Jersey Pulverizing Co., New York City
Ralph T. Sevens, Cape May Sand Co., Cape May, N. J.
Junius M. Strouss, Deckers Creek Sand Co., Morgantown, W. Va.
M. R. Taggart, Taggart & Co., Philadelphia
Arnold H. Tanzer, New Jersey Pulverizing Co., New York City
George A. Thornton, Ottawa Silica Co., Ottawa, Ill.
Stanton Walker, National Industrial Sand Assn., Washington, D. C.
A. Warsaw, Wedron Silica Co., Chicago
Floyd M. Wheat, National Pulverizing Co., Millville, N. J.
C. Franklin Wolf, New Jersey Silica Sand Co., Millville, N. J.
Clarence R. Wolf, New Jersey Silica Sand Co., Millville, N. J.

Manpower (*from page 58*)

the course of their pregnancy," continued Mrs. Hobart.

More women suffer from fatigue than any other cause of ill health. Fatigue develops after three or four months, and comprises not only physical and psychological aspects but also social conditions. The second largest cause of ill-health is home responsibilities: aged parents, relatives, or uncoöperative husbands.

Our greatest need, said Mrs. Hobart, is to "revise generally and make more adequate our selection programs. Better preëmployment examinations to establish general health, pregnancy or non-pregnancy, special physical qualifications for special requirements of the job are a basic necessity.

"The typical woman is unequal to many of the jobs of heavy industry," declared Mrs. Hobart. "This means a very much closer coördination between the medical departments and placement departments than has been usual. Medical departments will have to know jobs for which they are examining with a great deal more thoroughness than in the past."

Interviews, continued Mrs. Hobart, should disclose: "(1) temperamental fitness for jobs, (2) attitudes toward work, (3) actual responsibilities which women carry upon assuming industrial work, including the number and ages of children. It is impractical to wait until a woman is worn out from the effort of trying to take care of her children or other dependents and her job before we discuss the problem with her or even know that she has a problem."

Very much better training is another means of meeting health problems, said Mrs. Hobart. Most plants have done a superlative job in the technical phases of training, but have yet to see that, in relation to women, psychological aspects are of as great importance.

Better orientation or induction programs should discuss not only the rules and regulations of the plant, but the worker's place in the organization, the function of the organization, elementary safety, conduct to be expected. With women, unless there is a sense of importance about the job, there is a tendency not to push through when the going becomes difficult.

There is need for definite health and fitness programs, said Mrs. Hobart. We should get away in general from anything beyond the 8-hour-day, 48-hour week standard. In England women work somewhat longer hours than this, but for them transportation does not involve such distances as are common in this country. Hours of work should be broken by rest periods, varying with the intensity of the job, but having a minimum of 10 minutes each half shift.

Where plants have promoted good feeding programs, there has been a very marked improvement not only in attendance of the women at their jobs, but in the production itself while they are there.

In providing for child care, said Mrs. Hobart, "it may be that the best method is to shorten the length of our shifts to 6 hours perhaps; to increase the time of rotation of shifts, and to have more assigned to permanent shifts. Very much greater experiments in the employment of women on a part-time basis should be undertaken."

Women counselors must be something more than sympathetic souls; they must be versed in industrial practices and needs, with a sense of production and with a very firm desire to provide services for the women with a view to increasing production.

In the final paper Dr. E. J. Stieglitz of Washington, D. C., said that many organizations now go to great lengths to insure that new young employees fit into appropriate jobs. "This is splendid," he said, "but it doesn't go far enough. All too frequently as time goes on the job remains the same but the man does not. He changes with age. As he changes, the fit between man and job often gets worse and worse. Consequently friction arises; friction causes inefficiency." Completed work is reduced. The worker is affected by emotional stresses which he and the employer fail to recognize. Resentment and futility play havoc with production. Criticism brings either resignation or complaints. There is much waste.

The job must be changed as the man changes, said Dr. Stieglitz. The loudest objection, that "'you can't teach an old dog new tricks' is utterly false," he added. It already has done immeasurable harm, and more than any other influence has retarded man's development. What deprecates one's ability to learn far more than age *per se* is disuse, he said.

CHAIN SYSTEMS IN ROTARY KILNS

WITH wet-process rotary-kiln installations such as cement kilns and kilns for the recalcination of lime sludge and for the agglomeration of flotation concentrates and ore fines, a substantial heat loss occurs when relatively-high-temperature exhaust gases from such kilns are discharged directly to the stack.

Any effective means, whereby the heat in the exhaust gases from a wet-process kiln is used in predrying the slurry fed to the kiln, will result in a lowering of the temperature of the gases and consequently in a saving in the fuel fired to the kiln.

Under the present conditions where fuels should be conserved to the maximum, such a means for effective heat recovery and fuel saving becomes particularly important. When it is considered that a reduction of 100 degrees F. in the temperature of the kiln exhaust gases will ordinarily result in a saving in the fuel fired to a wet-process cement kiln of approximately 5 per cent., it can readily be understood that a reduction in the exhaust-gas temperature of approximately 300 degrees F., for instance from 1,000 to 700 degrees F., will result in a fuel saving of about 15 per cent.

One simple effective method of reducing the stack-gas temperature of wet-process kilns is to employ a system of chains suspended in the feed end of the kiln. A number of years ago F. L. Smidth & Company introduced a patented system consisting of a multiplicity of chain loops which are suspended from specially designed supports invented by Louis Petersen. These chain loops are so arranged that the chains in addition to lifting the slurry into the path of the hot gases also serve to convey the raw material in the direction of the burning zone of the kiln.

As an indication of the importance of this fuel saving in the economy of utilizing the nation's resources, consider that the cement industry in the year 1942 produced 181,153,000 barrels of cement clinker and that 51.9 per cent. of this clinker was produced by the wet process. Assuming that 80 per cent. of the wet-process cement kilns are chain-system equipped, then about 70,000,000 barrels of clinker was produced during the year 1942 in chain-system-equipped kilns. Assuming further that all these kilns were coal-fired, that the average coal consumption amounted to 120 pounds per barrel of clinker produced, and that the average saving due to a chain-system installation would be about 15 per cent., then the total annual saving in fuel due to the chain-system installations would amount to the impressive total of 700,000 tons of coal.

Figure 1 shows an installation of such a chain system. It will be noted that the chains are uniformly distributed over the cross-sectional area of the kiln and yet provide for passage of the material through the kiln.

The heat transfer from the gases to the material is effected by the slurry forming a layer on the chains, whereby a large increase of heat-transferring surface and intimate contact between the slurry and the gases are obtained. Furthermore, the chains absorb heat from the kiln gases while hanging in the free cross-sectional area of the kiln and this heat is transferred to the slurry or partly-dried material when the chains are submerged.

The heat transfer from the kiln gases to the material depends upon the total active surface of the chains. The Smidth patented distorted chain, invented by A. B. Zahn and illustrated in Figure 2, has about 22 per cent. greater surface per lineal foot than the corresponding size of standard chain.

In addition to improving the fuel economy, a heat-recuperating chain system, when used in conjunction with induced-draft equipment, will result in a substantial increase in the capacity of the kiln. The large drying surface of the chains has the same effect as though the drying zone and, hence, the entire kiln had been longer. It is natural, therefore, that the installation of a chain system normally results in an increased output.

The fact that the material is calcined to a greater extent by the time it reaches the burning zone in a chain-system-equipped kiln, is a factor that facilitates the operation of the kiln and improves the quality of the product.

Due to the fact that the large chain surface in the feed end of the kiln is covered with slurry and forms a dense wet curtain through which the gases have to pass, the chain system normally effects a substantial reduction in dust loss.

Since the chain system forms an integral part of the rotary kiln, its installation requires no added floor space and no additional power.

Figure 1. Typical chain-system installation in a rotary kiln.

While induced draft is recommended in order to get the full benefit of chain systems, a large number of chain systems have been installed in rotary kilns operating by natural draft in conjunction with large stacks. For natural-draft installations the chain systems are designed with less density than for induced draft and the result in fuel saving and output is correspondingly reduced. However, the fuel saving has invariably justified the installation and, as a rule, the investment has been returned in less than one year of operation.

The use of induced-draft equip-

Figure 2. Distorted chain links provide maximum heat-transfer surface.

By ROBERT SALMONSEN
Assistant to Vice-President,
F. L. Smith & Company

ment in conjunction with chain-system-equipped kilns makes possible a better control of the kiln operation.

Induced-draft fans are ordinarily driven by means of constant-speed squirrel-cage motors. Any variation in the draft required in operating the kiln is obtained by regulating a special type of *louvre* damper (Fig. 3) installed at the inlet side of the induced-draft fan. This damper is driven by a fractional-horsepower motor remotely operated by a push-button control from the burner's platform. An electrical position indicator shows the amount the *louvre* damper is open and red and green indicating lights show when the damper is fully open or fully closed.

The improved control obtained by the use of induced-draft equipment results in a more uniform operation of the kiln which is, of course, reflected in the more uniform product obtained.

In order to protect the induced-draft fan from high temperatures due to abnormal kiln operation, a temperature alarm device is installed in the duct work ahead of the induced-draft fan. If abnormal operation should cause the temperature of the kiln exhaust gases to increase to a pre-determined amount, the temperature alarm acts, sounding an alarm on the burner's platform to warn the kiln operator so that the necessary corrective measures may be taken.

On modern kiln installations it is

Figure 3. Typical louvre damper.

Figure 4. Typical control panel for chain-equipped kilns.

normal practice to provide centralized kiln-control equipment with the necessary instrumentation and control which will give the kiln operator complete information regarding the performance of the kiln and accessory equipment.

In connection with the induced-draft chain systems it is normal practice to employ a somewhat simplified centralized control mounted on a panel located at the burner's platform (Figure 4). A panel of this type is usually equipped with an ammeter and a push button for the induced-draft fan motor, an electrical position indicator, indicating lights and a push-button station for the *louvre* damper, an indicating light for the high-temperature alarm device, a draft gage indicating the draft in the feed end of the kiln, and an electrical signal horn. The most important instrument for the operation of kilns with chain systems is the pyrometer measuring the temperature in the feed end of the kiln and normally the panel would include the indicator or recorder for this device.

In order to obtain complete control over the combustion in the kiln and to effect the maximum economy in fuel, electrical gas-analyzing equipment, measuring CO_2 and CO contents of the kiln gases, has been installed with very satisfactory results. The gas-analyzing equipment consists of a cabinet with the analyzing equipment proper and a sampling device located at the feed end of the kiln and with the indicators and electrical recorder mounted on the burner's platform. Usually the recording equipment is mounted in a dust-proof enclosure with a glass front. The gas analyzer recorder is a strip-chart recorder and has the advantage that the various shifts can study the past operation of the kiln when they come on duty and exercise the necessary precautions so that the most efficient kiln operation can be obtained.

Juan Soldado *(from page 57)*

among them, variable-speed coal-feeder drives on the cement kilns and direct-fired boilers.

A complete physical and chemical laboratory will be installed in the administration building of the plant.

Eight miles of railroad, leading from Serena and Coquimbo to the plant site, has been finished. Adjacent to the railroad siding in the plant will be located a 65- by 180-foot machine-shop building equipped to take care of all ordinary repairs at the plant.

An 800,000-gallon storage tank for fuel oil is also provided.

Housing Development From the general view of the plant it can be noted that it is a self-contained community in which 180 to 200 families will live and for which proper housing facilities have been provided. This community will also have a railroad station, a theater, a social club, stores, a church, a hospital, an athletic field, a fire station, etc. This project will be developed gradually over a period of three to four years.

WLB Denies Appeal on Holiday Pay

The National War Labor Board has denied an appeal by the Michigan Limestone & Chemical Corporation, Buffalo, from a WLB order, that employees be paid for six holidays they do not work during the year.

The WLB ruled the appeal was on insufficient grounds and did not prove that the order was unfair or that it constituted a hardship on the company.

High-Speed Sand-and-Gravel Plant Serves War Jobs in Newport Area

THE River Sand & Gravel Company plant at Seekonk, Massachusetts, near Pawtucket, Rhode Island, is a recently-built example of efficient design and construction for high-speed operation to serve urgent war-construction projects. Owned by a partnership of the McHale brothers, formerly John J. McHale & Sons, Inc., of 90 Ferris Street, Pawtucket, the new gravel plant was built primarily to supply aggregate for a large amount of ready-mixed concrete which the McHales have contracted to furnish for several naval projects in the Newport, Rhode Island, area, about 25 miles south of Seekonk.

By SPENCER JONES

Designed jointly by the McHales and the Anderson Engineering Company, of Cambridge, Massachusetts, the plant has a capacity of 125 tons per hour when producing 1-inch gravel, and 180 tons per hour when producing 1½-inch gravel. About 60 per cent. of the finished product is gravel.

The deposit, called the Newman Avenue gravel bank for want of a better name, is of glacial origin. Both coarse and fine materials are extremely sharp, and the bank is quite "bony," containing about 35 per cent. sand to 65 per cent. gravel. In addition, the deposit is tightly packed, which makes digging rather difficult.

The entire operation occupies an area of some 50 acres, from which an average of 2 feet of topsoil and earth was stripped by a 15-cubic yard LeTourneau scraper pulled by a D-8 Caterpillar tractor.

With a K-360 Link-Belt Speeder shovel, using a 1¾-cubic yard Amsco dipper, the deposit was opened by digging a steep ramp to develop a 20-foot to 22-foot face. A higher face would be impractical because ground water is reached about 24 feet below the stripped surface of the ground.

Bank-run material weighs approximately 3,300 pounds per cubic yard, and there are comparatively few bowlders larger than 14 inches in diameter. The shovel, easily able to load out 300 tons per hour, has no trouble supplying all the plant's requirements, with occasional time to spare for work at the stock piles.

Two and sometimes three end-dump trucks, Sterlings, Chevrolets or Hugs, haul bank-run material 300 to 500 feet from the shovel to the plant. The trucks dump into a 15-cubic yard wooden hopper through a railroad-rail grizzly, the rails being spaced 14 inches apart.

Beneath the hopper a 30-inch by 5½-foot Telsmith self-contained reciprocating-plate feeder, independently driven through V-belts by a 3-horsepower Fairbanks-Morse motor which operates at 1,200-r.p.m. on 550-volt, 3-phase, 60-cycle current, feeds material to a 30-inch, 6-ply rubber-belt conveyor. Regulation of the tonnage delivered to the belt is made by changing the length of the stroke, merely by adjusting an eccentric inside each of the two cams which give the plate its reciprocating motion. The capacity of the feeder can thus be altered from 75 up to as much as 290 tons per hour without stopping the plant.

General view of scalping-and-crushing portion of plant.

Looking down from top of silos along finished-product conveyor.

The 30-inch belt is 87 feet long and travels at a speed of 225 f.p.m., being driven by a 15-horsepower, 1,200-r.p.m. Fairbanks-Morse motor through V-belts. Supported on an Anderson Engineering Company steel frame, the conveyor has Link-Belt ball-bearing head and tail pulleys and runs on Chain Belt ball-bearing Rex idlers.

The belt discharges over a No. 450

Launder from sizing screen above silos to the two sand tanks.

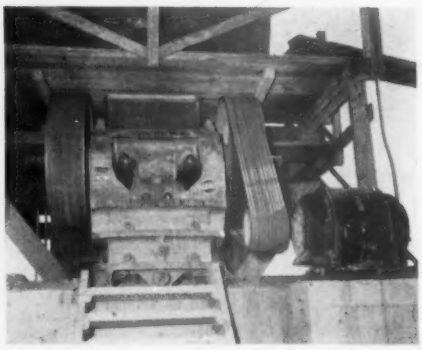
Telsmith rotary grizzly which has 3¼-inch openings. This piece of equipment requires only about 3 horsepower and is flat-belt-driven from the shaft of the head pulley of the belt that feeds it. Here a considerable tonnage of undersized material is removed automatically and continuously without the need of supervision.

Plus-3¼-inch material falls into an 18- by 30-inch Telsmith-Wheeling roller-bearing jaw crusher, driven through eleven V-belts by a

Shovel with 1¾-cubic yard dipper loading out bank-run material for plant.

60-horsepower, 1,200-r.p.m. Fairbanks-Morse motor. With its discharge opening set at 3¼ inches the crusher has a capacity of about 50 tons per hour, which is ample.

Minus-3¼-inch material falling through the rotary grizzly, or discharged from the end of it, goes to a 24-inch by 83-foot, 6-ply rubber-belt conveyor, which also receives material discharged by the jaw crusher. This belt has a speed of 225 f.p.m. and is driven through V-belts by a 10-horsepower, 1,200-r.p.m. Fairbanks-Morse motor. It is supported on an Anderson Engineering Company steel frame and has ball-bearing Link-Belt head and tail pulleys and runs on Chain Belt ball-bearing Rex idlers.



Jaw crusher, V-belt drive and 60-horsepower motor.

The 24-inch belt discharges on a 4- by 10-foot, single-deck Telsmith Pulsator, driven through V-belts by a 5-horsepower, 1,750-r.p.m. Fairbanks-Morse motor. This vibrating screen uses either 1½-inch or 1-inch square wire mesh or circular perforated metal for scalping off plus-1-inch or 1½-inch, which goes into a No. 36 Telsmith Gyrasphere reduction crusher driven through V-belts by a 75-horsepower, 1,200-r.p.m. Fairbanks-Morse motor. The crusher discharge is set at about 1½ inches down to 1 inch, depending on production requirements. In either case it has ample capacity to reduce about 130 tons per hour down to 1½ inch, or about 115 tons per hour down to 1 inch.

Water sprays deluging material as it slides down chute from finished-product conveyor to sizing screen.

When crushed, the material is carried on an 18-inch by 37½-foot, 6-ply rubber-belt conveyor back to the lower end of the 83-foot conveyor, closing the circuit. This 18-inch belt is driven through V-belts by a 7½-horsepower, 1,200-r.p.m. Fairbanks-Morse motor, and has an Anderson

The rotary grizzly.

Engineering Company steel frame with Link-Belt ball-bearing head and tail pulleys and Chain Belt ball-bearing Rex idlers. Its speed is 225 f.p.m.

Minus-1½-inch or 1-inch material passing through the scalping screen goes to a 24-inch by 187-foot finished-product conveyor. This is a 6-ply rubber belt, driven through V-belts by a 20-horsepower, 1,200-r.p.m. Fairbanks-Morse motor. It is supported on an Anderson Engineering Company steel frame and runs at 225 f.p.m. around Link-Belt ball-bearing head and tail pulleys with Chain Belt ball-bearing Rex idlers.

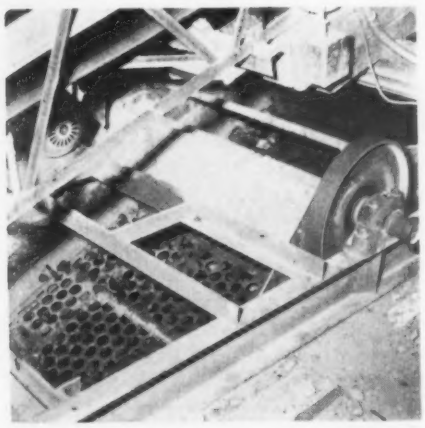
This belt discharges on a 5- by 12-foot Telsmith double-deck Pulsator, driven through V-belts by a 10-horsepower, 1,750-r.p.m. Fairbanks-Morse motor. When making 1½-inch stone the upper deck of the sizing screen has a 1-inch square wire mesh or 1-inch hexagonically-perforated metal screen. The lower deck is always ¼-inch square wire mesh.

Material rejected by the upper deck falls into a silo in which 1½-inch stone is stored. Material passing through the upper deck, but rejected by the lower deck, falls into

another silo in which minus 1-inch (or "pea stone") is stored.

The two silos are of reinforced-concrete-stave construction, and are 14-feet internal diameter by 47½-feet high, with a capacity of 200 tons each. They were designed and erected by the Neff & Fry Company and are equipped with bin gates for loading into trucks. Far more than self-supporting, these silos also support the upper end of the 24-inch by 187-foot conveyor as well as all the sizing and washing equipment, except two Telsmith sand tanks.

The first water used in the operation is sprayed over the material as it slides down a chute from the finished-product conveyor to the double-deck sizing screen. This water, which is exceptionally pure, comes from a near, artifically-dug pond on company property and is pumped by a 6-inch Fairbanks-Morse direct-connected centrifugal pump, driven by a 50-horsepower Fairbanks-Morse motor. "Sprayed" is hardly the word to use, for material coming off the finished-product conveyor is deluged at the chute and the sizing screen with about 1,200 g.p.m. delivered by this pump against a 60-foot head.



Single-deck vibrating screen, used for secondary scalping.

Water is carried from the pump to the sprays through 10-inch Taylor spiral-weld pipe, joined together with Taylor forged-steel bolted joints, sleeve type. An interesting feature of the pipe installation is the fact that the 60-foot length which goes up vertically beside the silos is entirely self-supporting, no braces or hangers being used.

Minus-¼-inch material, washed and vibrated through the lower deck of the sizing screen, is flushed down a Y-shaped, wide, shallow launder and into two No. 8 Telsmith sand tanks that are supported on a timber tower independent of the silos. Each sand tank holds about 155 cubic feet and has a capacity of about 80 tons of coarse sand per hour, and a water capacity, while catching coarse sand, of probably 900 g.p.m. The sand tanks are entirely automatic, working by gravity and requiring no mechanical power. The moisture content of the discharged sand averages about 25 per cent., but there is

Truck getting a load of stone from the bin gate of one of the silos. Note 10-inch spiral-weld pipe running, unbraced, up silos.

ample opportunity for the sand stock pile, on which the sand tanks discharge, to drain before the pile is rehandled. A flume carries the water from the sand tanks back to the pond.

At the sand stock piles most of the rehandling and loading of sand into trucks is done with a Model 550 Lima shovel of 1¼-cubic yard dipper capacity. When necessary, the Lima shovel works at the pit face, just as the Link-Belt Speeder shovel occasionally rehandles or loads out sand into trucks.

Not every gravel-pit operator is so situated that he needs to make only

Close-up view of concrete-stave silos and spiral-weld pipe.

two or three sizes of stone and one size of sand and has a market for all these sizes he can make. But that is the only advantage the McHales had when they decided to build their River Sand & Gravel Company plant. Those who supply material to the U. S. Navy know how strict the specifications are, hence there could be nothing left to chance in the investigation of raw materials or the quality of the finished products.

The Newman Avenue property was topographically surveyed and sampled and the samples were subjected to physical and chemical tests. The adequacy and quality of the water supply were determined. Power costs were checked to determine if current should be purchased or generated at the plant. The desired hourly output tonnage was determined, as well as the desired per-

The gyratory crusher. Recirculating conveyor extends up to left from back of motor. Conveyor leading up from left to right across upper left corner feeds second scalping screen.

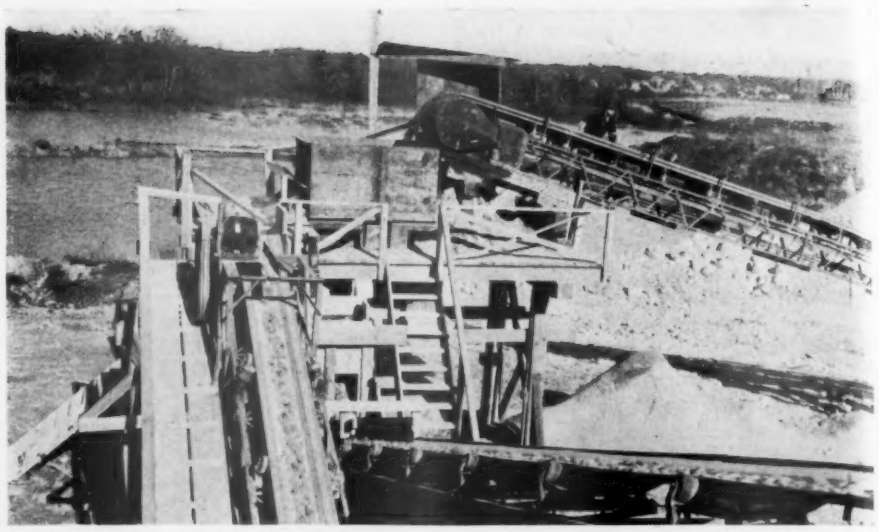
centages of each type of product. Analysis of bank-run samples gave the information on the amount of washing required, the amount of crushing to be done, and the size and type of scalping and sizing screens to be used. A study of transportation to and the demand at the point of delivery made it possible to determine what storage facilities should be used.

As an indication of the accuracy with which the equipment was figured, it might be interesting to follow through a typical crushing and screening analysis when 1½-inch stone, "pea stone" and concrete sand are being produced.

Loader working at stock pile. View taken looking down from top of silos.

	Sizes	Pit Analysis	Needed Output
(A)	Plus-3¼-inch, minus-14-inch...	15.0%	.....
(B)	Plus-1½-inch, minus-3¼-inch..	25.0%	.....
(C)	Plus-1-inch, minus 1½-inch..	15.0%	26.0%
(D)	Plus-¼-inch, minus-1-inch....	10.0%	34.0%
(E)	Minus-¼-inch...	35.0%	40.0%
		100.0%	100.0%

The 1¼-cubic yard shovel loading out sand.



Primary scalping-and-crushing section, and upper end of recirculating conveyor from crusher back to belt that supplies second scalping screen.

James A. McHale, president and treasurer, River Sand & Gravel Company.

With 15 per cent. of the bank-run material plus-3¼-inch, a rotary grizzly of comparatively small cost and almost negligible power consumption was adequate for scalping out the remaining 85 per cent. of the finer material. To scalp first at plus-3¼-inch and crush at a setting of 3¼ inch, and then to scalp again at plus-1½-inch and recrush at a setting of 1½ inch seemed desirable. This made possible the use of a jaw crusher for the primary, instead of the more expensive gyratory. Primary crusher output figures are:

Sizes	Jaw Crusher Product	Plant Feed	Feed to 2nd Scalper
(B)	15.0%	2.3%	27.3%
(C)	45.0%	6.7%	21.7%
(D)	30.0%	4.5%	14.5%
(E)	10.0%	1.5%	36.5%
	100.0%	15.0%	100.0%

The No. 36 gyratory has, of course, greater capacity than is required for recrushing to 1½ inch, but is also used for recrushing to 1 inch, for which its capacity is still ample. Designed for an unregulated and unlimited choke feed, with the crushing chamber filled to capacity, this secondary crusher has a large steel feed hopper which acts as a surge bin. This crusher's output figures are:

Sizes	Gyrasphere Output	Plant Feed	Feed to Sizing Screens
(C)	15.0%	4.1%	25.8%
(D)	70.0%	19.1%	33.6%
(E)	15.0%	4.1%	40.6%
	100.0%	27.3%	100.0%

The pit-analysis and crusher output figures, as well as the estimates of percentages of needed output of various sizes, are variable within moderate limits, although reasonably typical of the operation as a whole.

A foreman, Ovila Dufort, and two employees operate the plant. The only other employees at the operation are the two shovel operators and two or three truck drivers. A Model 83 Barber-Greene loader, used at the stone stock piles, is operated by one or the other of the plant employees as necessity arises.

James A. McHale is president and treasurer of the company.

Moves Equipment Into Union Pacific Quarry

The Concrete Materials & Construction Company of Cedar Rapids, Iowa, operator of two stationary aggregates plants and eight or nine portable units, has moved equipment into the old Union Pacific quarry near Blue Springs, Nebraska, to produce aggregates for the building of the Hastings naval-supply depot.

E. R. Wolfe is superintending the operations.

New Wisconsin Silica-Sand Plant Replaces One Destroyed by Fire

A view of the new concrete-and-steel plant of the Browntown Silica Company. Loading hopper, conveyors, crushers and pipe-line to draining-bin building are in foreground on quarry floor.

By HARRY F. UTLEY

AT Browntown, Wisconsin, on a 256-acre outcrop of the St. Peter sandstone, the Browntown Silica Company has just completed a new plant for the production of washed and ground silica sand.

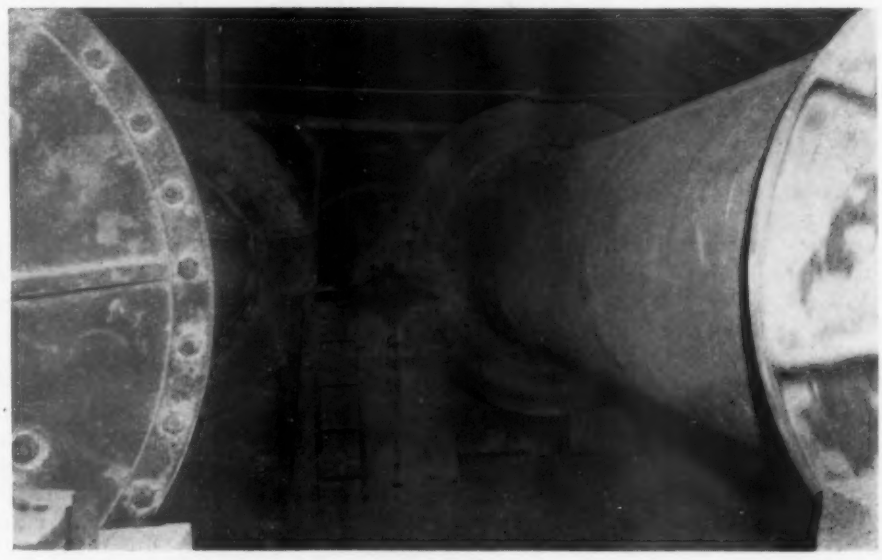
The new plant replaces one destroyed by fire nearly two years ago. The buildings are of steel and concrete construction, all the equipment is driven by independent electric motors with power produced at the plant by Diesel-driven generators, and a complete dust-collecting system keeps the plant free from the fine siliceous dust which might otherwise endanger the health of the workmen.

The deposit at Browntown was worked originally by the old White Rock Silica Company, operations having started about 1928. Allen C. Wehenn, secretary of the old White Rock company of which his father, the late Robert Wehenn, was president, now heads the Wehenn Abrasive Company, Chicago, which contracts to sell the output of the present Browntown plant.

About 10 or 12 feet of overburden is now being encountered and this is removed by a 1-cubic yard Koehring gasoline-powered shovel, the spoil being hauled to discard by dump trucks. The face is drilled by contract with a well-driller. About ten 65-foot holes are shot at intervals, a blast of this type normally bringing down about 15,000 tons of sandstone. Much of the material is white to blue-white in color and compares favorably with the sand in the Ottawa, Illinois, district. The same shovel used for stripping is also used on the floor of the quarry to load the blasted sandstone into a 5-cubic yard hopper. This hopper feeds two connecting lengths of portable belt-conveyors with a total length of about 150 feet which carries the raw material to a Goods Roads 9- by 36-inch jaw crusher followed by a pair of closely-set, smooth 20- by 24-inch Lippman Engineering Works rolls. The product has then largely been reduced to grain size and is washed into a 4- by 18-foot revolving screen. This screen is in closed circuit with the rolls and is fitted with ⅛-inch cloth. The "throughs" go to a 5-cubic yard concrete sump for pumping to the plant. All the aforementioned equipment is located on the quarry floor.

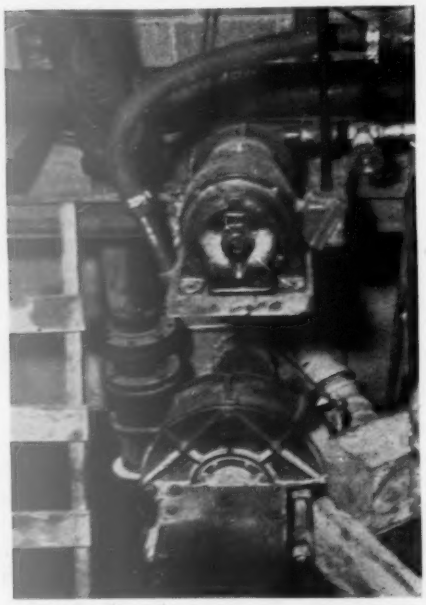
A Hydroseal pump, with an 8-inch suction pipe and a 6-inch discharge and operating under a 45-foot head, lifts the sand through a 6-inch wrought-iron pipeline to two 10-cubic yard wash bins in one of the new plant structures. These bins have jet pipes in the bottoms where water under 40-pound pressure agitates, cleanses and further breaks down the sand to grain size.

The washed sand is fed by gravity to four 20- by 30-foot concrete



Two of the four tube-mills used to grind the sand to extreme fineness.

draining bins where the material is allowed to drain for about 48 hours. It is then transferred by a Yale & Towne overhead electric crane equipped with a 1½-cubic yard clamshell bucket to a steam-coil drier located in an adjoining room. An induced-draft fan forces the resulting vapor into the atmosphere through ports in the drier shell. As the completely-dried sand reaches the bottom of the drier it drops on a horizontal belt conveyor on 20-foot centers and is discharged into the boot of an inclosed belt-bucket elevator. The 16-inch buckets raise the sand 70 feet to the highest point in the plant and discharge it over a chute to a 3- by 5-foot single-deck



The 6-inch pump which pumps the sand from the quarry sump to the plant.

vibrating scalping screen carrying Number 20 cloth. The oversize from the screen is spouted to bins to be sold, largely locally, as a material for sanding icy pavements in the winter. The "throughs" are classified in a bank of six inclosed vibrators and stored in bins, the coarsest sand being Number 20-40 mesh and the finest Number 80-100 mesh.

Four tube-mills of Allis-Chalmers and F. L. Smidth manufacture are used for grinding the sand. Two of these are 5- by 22-foot units and are located in a building adjacent to three 14- by 32-foot concrete-stave storage silos from which the mill feed is drawn. The other two are 6- by 22-feet in size, installed on the ground floor of the screening-and-storage building, and are fed from the storage bins overhead. The mills have quartzite-block liners and use 2- to 3-inch grinding pebbles produced by one of the company's subsidiaries, the Baraboo Quartzite Company. Before the war practically all grinding was done with pebbles imported from France and Belgium but this supply was, of course, cut off when the war began. A search for grinding pebbles was made by the company which took its representatives over a large part of the United States and Canada. After numerous tests, they found the best available material in a hard, pre-Cambrian stone near Baraboo, Wisconsin—

The dust-collector installed on the quarry cliff. Duct from plant at the left.

The storage bins and silos.

within 100 miles of the Browntown plant. Tests have shown that these quartzite pebbles grind even faster than flint pebbles. Perhaps the reason for this is the difference in the formation of the rock. French and Belgian pebbles have a tendency to grind quite smoothly—almost to the point of being slippery—while the Baraboo stone has a tendency to be a little rougher and less slippery. As grinding is done by attrition, it is easy to see that rock that is less slippery would do better and faster grinding, resulting in a greater output. These pebbles grind almost pure white so there is no discoloration or contamination of the finished material. The pebbles are blasted from solid rock and broken down to 2- and 3-inch size and then tumbled in mills to get them into pebble shape.

The products of the tube-mills are elevated to two bins above the packer.

A wide variety of ground sand can be made in the tube-mills, the fineness being governed by the rate of the feed. In general, products of which 98 per cent. passes 200-mesh and one of which the same percentage passes 140-mesh are in the greatest demand, although finer, coarser, or in-between sizes can be produced by the mills if desired. Each mill can turn out from 35 to

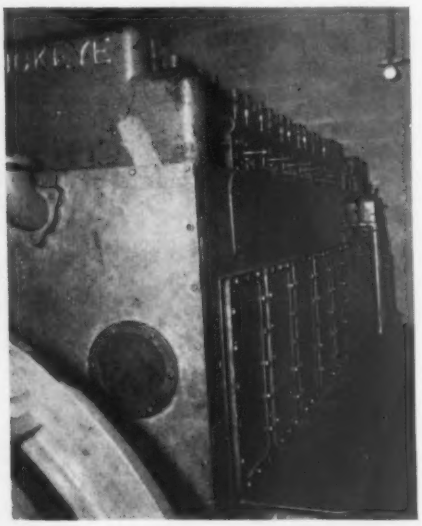
New four-tube bag-packer.

50 tons of ground silica per day, depending upon the fineness to which it is being ground.

The St. Regis valve-pack system is used to bag the ground product, a new-type machine equipped with 4 filling tubes having been lately installed. Paper bags of 100 pounds capacity are used exclusively, the filled bags being hand-trucked to a loading platform for box-cars alongside the building. The bagged product is sold for a wide variety of uses —as an abrasive agent in cleansers, as an ingredient in porcelain enameling, for foundry mold wash, dental use, and possibly a score of other chemical and industrial purposes.

A small testing laboratory is equipped to make control and quality tests of the sand to insure that the specifications of the purchaser are strictly complied with.

The various storage bins have a combined capacity of 1,700 tons. While any of them can feed the tube-mills, they are also equipped with gates on the track sides for



The 450-horsepower Diesel engine, main power source at the plant.

loading directly into cars. Large quantities of molding sand for steel foundries are shipped in this manner. The plant's total capacity is about 600 tons daily.

Perched on a knob high above the plant and some distance from it the company has installed an efficient dust-collector of the multiple-tube cloth-bag type. The system was designed and supplied by the Ruemelin Manufacturing Company of Milwaukee and has connections at every point in the plant where harmful dust originates. While this system keeps the plant practically dust-free, the employees are further protected by the wearing of comfortable respirators supplied by the company.

A.-c. power is generated at the plant at 440 volts, which is the voltage used by all the motors except those on the overhead crane over the draining bins. A separate motor-generator set converts the current to

Portable Diesel engine for auxiliary power. The building is now being completed and a stationary 260-horsepower Diesel engine is being installed.

d.-c. for these motors. A Buckeye 450-horsepower Diesel engine, direct-connected to an Electric Machinery Manufacturing Company generator, will later be synchronized with a Buckeye 260-horsepower Diesel driving a G E alternator. Until this second engine arrives, the G E machine is temporarily being driven by a portable Caterpillar D11000 Diesel in another building which is under construction and adjoins the structure housing the 450-horsepower Buckeye.

The company operates a complete machine shop for repairs, general maintenance, and the manufacture of equipment. A Hobart arc-welder, for example, is a well-used piece of equipment as the highly abrasive silica sand wears out metal rapidly. The welder is constantly being called upon to reface numerous worn parts with hard-surfacing metals. All the vibrating screens used in the plant were built at the plant and were designed by P. W. Palmer, president. Mr. Palmer and his brother, J. E. Palmer, vice-president, also own and operate the previously-mentioned Baraboo Quartzite Company at Baraboo, the Hartland Sand & Gravel Company at Hartland, and the Hartland-Verona Gravel Company at Verona, all in Wisconsin.

Five Companies Working New Bauxite Reserves

Following the discovery of important new reserves of bauxite in Alabama by the Bureau of Mines and the Geological Survey, five private companies already have begun commercial development of eight of the deposits, Secretary of the Interior Harold L. Ickes has announced.

A total of 33 new bauxite deposits have been explored in the Eufaula district of Henry and Barbour Counties in Alabama as a result of the expanded program of the two Interior Department agencies, the Secretary said, and additional reserves are being discovered nearly four times as fast as the bauxite is being mined.

Because of the rapid commercial utilization of the deposits, the exploratory program can be considered self-sustaining, Secretary Ickes stated, since the income taxes to be paid by property owners on royalties, the corporate taxes of the producing companies, and the income taxes of employes, will return more to the government than the costs of the drilling program. Property owners are said to receive royalties from lessee and mining companies ranging from 50 cents to $1 per ton of bauxite.

The five mining companies already have shipped 40,300 tons of bauxite. The eight deposits contained a total of about 179,000 tons of marketable-grade material, which, however is a small fraction of domestic production. Overburden, or soil, has been removed from an additional 104,000 tons, leaving 34,700 tons in reserve for future operations.

Estimates of the Bureau of Mines and the Geological Survey place the total amount of bauxitic material in the 33 newly discovered deposits at 1,680,000 tons, including 352,800 tons of commercial-grade bauxite. Most of the bauxite is in numerous small deposits under shallow overburden which can be removed easily. The exposed bauxite then is mined by open-pit or stripping methods.

As a result of the Bureau's intensive exploratory program for the ores of aluminum in the United States, the known reserves of domestic bauxite of all grades have been increased by several million tons of which only a small percentage can be used in existing plants, and those of alumina-bearing clays by more than 100,000,000 tons.

Bureau officials said that the use of two auger-type power drills has reduced drilling costs in the Alabama bauxite exploratory work to about 40 cents per foot for the 2,000 holes which have been drilled for a total distance of 100,000 feet. The drills are capable of boring from three to five 50-foot holes in 8 hours.

AIR COMPRESSORS

Part II—Aftercoolers

By C. W. GIBBS
Compressor Engineering Department,
Ingersoll-Rand Company

THE quarryman, miner, or cement-mill operator who has not been bothered by water in his compressed air is fortunate indeed. His is a favored location, for it is only in a few places that water in air lines would not at some time appear.

These statements imply that water and air are more or less inseparable, and, indeed, in most climates that is so. When they are compressed, however, they become quite separable and that is just what causes the trouble. Although often accepted as a necessary evil, it is nevertheless true that most of the water in air lines can be eliminated. This article is presented in the belief that an understanding of the principles involved will do much to make clear the remedies to be applied.

Water is harmful in compressed air because it destroys lubrication in air tools, causes them to operate sluggishly, slows production and increases maintenance. It produces hammer in the air lines, and may freeze in winter, breaking pipes and fittings or restricting the flow. When used for aerating cement in bins or for transporting cement through pipe lines, compressed air must obviously be free from water. "Blowing the lines" to rid them of collected condensate at the start of work wastes a tremendous amount of air —and time.

All free or atmospheric air as taken into a compressor contains more or less moisture or water vapor (steam). There is no such thing as *dry* air in nature. When air is spoken of as *dry* it is usually meant that it is *relatively* dry. Upon this ability of air to carry mositure depends the conveyance and distribution of water over the earth. Of course there are locations where the air contains very little moisture, such as the desert regions, and in those places it is unlikely that any water would appear in compressed-air lines, but there are few compressor plants in deserts.

Let us consider the general rules involved in this not too complex subject.

(1) The ability of air to carry moisture depends upon its temperature and volume and not materially upon its pressure.

(2) The higher the temperature, the greater the amount of water vapor that can be carried.

(3) The maximum amount of water vapor is carried when the air is "saturated." That is, the air can not carry any more moisture at the existing temperature. It is then said to have 100 per cent. relative humidity.

(4) Usually air has less than 100 per cent. relative humidity; it is not carrying its maximum amount. Note that this expression is a relative one only and states the proportion of vapor actually carried to that which saturated air would carry at the same temperature.

(5) Suppose we have a volume of air at 65 per cent. relative humidity —only 65 per cent. of a full load. If it is cooled, its capacity for carrying moisture is reduced and if cooled enough it will reach saturation or 100 per cent. relative humidity. The temperature at which 100 per cent. relative humidity is reached is known as the *dew point*, because moisture will start to condense with any further cooling.

Fog and dew are atmospheric moisture, cooled below the dew point. Rain is water condensed from clouds (vapor) which have been cooled below the dew point. In warm humid weather, pipes carrying cold water "sweat," *i. e.*, condense moisture from the surrounding air by lowering its temperature below the dew point.

(6) The opposite to (5) is also involved in our discussion. Air at any relative humidity, if heated, becomes capable of carrying more vapor and its relative humidity will decrease.

Note that in (5) and (6) the *weight* of the water vapor in the air does not change.

Remembering those facts, it should not be difficult to visualize what happens in the compressed-air system. Obviously, the compressor must take the atmospheric air (and vapor) as it finds it at the intake. The only source of water in the compressed-air lines is clearly the air which comes into the system through the compressor. Colder air entering the compressor intake is liable to take in less moisture. Therefore, the compressor should take the air from outdoors and from a point where rain and snow can not enter. Certainly the compressor intake should not be near a steam exhaust head.

In rules (1) to (6) it has been assumed that the volume of the air did not change. In the compressor cylinder, however, the volume does change; it is reduced when the pressure is increased. It was pointed out previously that pressure had no material influence on the moisture capacity of air. The volume effect may be stated as follows.

(7) The amount of moisture that

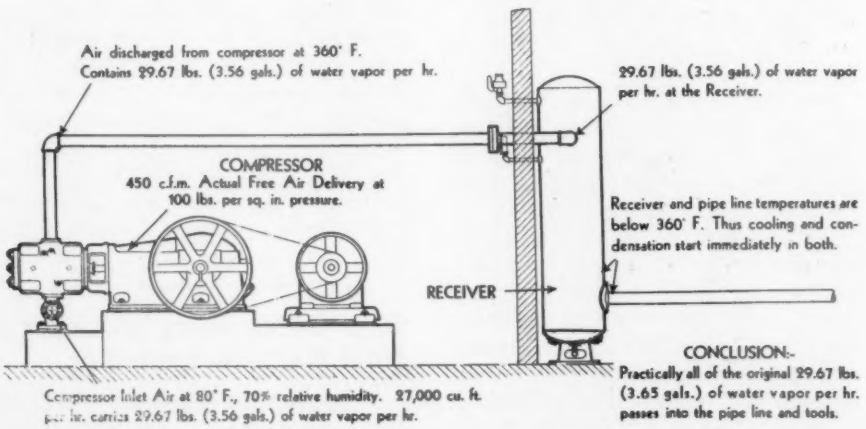

Air discharged from compressor at 360° F.
Contains 29.67 lbs. (3.56 gals.) of water vapor per hr.
29.67 lbs. (3.56 gals.) of water vapor per hr. at the Receiver.
COMPRESSOR
450 c.f.m. Actual Free Air Delivery at 100 lbs. per sq. in. pressure.
Receiver and pipe line temperatures are below 360° F. Thus cooling and condensation start immediately in both.
RECEIVER
CONCLUSION:-
Practically all of the original 29.67 lbs. (3.65 gals.) of water vapor per hr. passes into the pipe line and tools.
Compressor Inlet Air at 80° F., 70% relative humidity. 27,000 cu. ft. per hr. carries 29.67 lbs. (3.56 gals.) of water vapor per hr.

Figure 1. Air-compressor installations: without

air at a given temperature can hold is proportional to its volume.

Consider that 100 cubic feet of air is compressed to 50 cubic feet *with no change in temperature.* Its moisture-carrying capacity will be cut in halves. Or, to put it another way, if the original 100 cubic feet was at 50 per cent. *relative* humidity, the final humidity will be 100 per cent.

It happens, however, that during compression the air temperature does not remain constant, but rises rapidly. With each 20 degrees F. rise the capacity for holding moisture is almost doubled. So it is that under normal conditions there will be no condensation in the compressor cylinder, the moisture entering the cylinder being carried right through as a vapor.

For the time being we will assume single-stage compression. If the compressed air could be used hot as it comes from the compressor there would be practically no "water troubles." In actual practice cooling takes place in the air receiver and pipe lines and, in accordance with the principles previously stated, the moisture will condense as soon as the dew point is reached.

Since 100 pounds pressure involves 7.8 compressions (at sea level) or a final volume of only 13.5 per cent. of the original, it is evident that, if the air cools in the pipe line to the compressor-intake temperature, condensation will take place with any original relative humidity greater than 13.5 per cent. A representative average relative humidity in principal cities of the United States is close to 70 per cent., so the reasons for water in compressed air are clear.

Figure 1 shows graphically how much moisture is taken into a moderate-sized compressed-air system in the course of an hour. The left portion shows that almost all the vapor

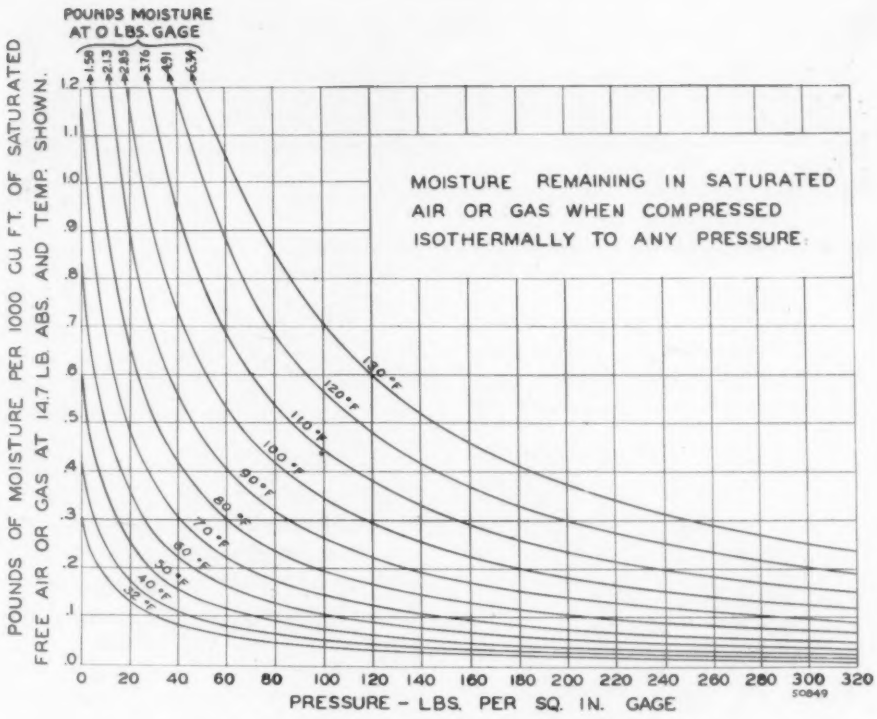


Figure 2. Curves which visualize aftercooler operation.

is carried over into the pipe lines to be condensed, while the right portion indicates how the simple additional of an aftercooler will eliminate most of the water by condensing and separating it before it gets into the pipe lines. Coolers will eliminate up to 85 per cent. of the water in compressed air, depending largely upon the cooling-water temperature available.

An aftercooler is just what its name suggests, a heat exchanger designed to cool the air immediately after compression. Cooling must extend materially below the dew point, thus condensing the moisture, and the condensate must be separated from the compressed air before it can go out into the plant lines. An automatic condensate trap is obviously a necessity on all coolers.

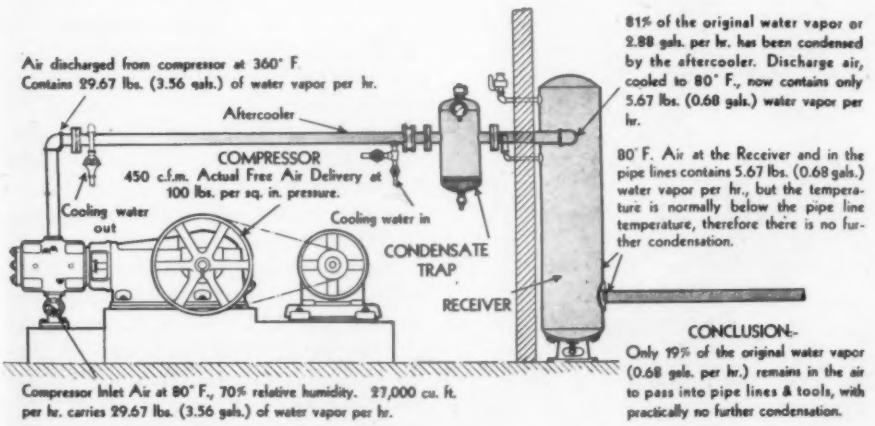
All this discussion has considered only single-stage compression, while many plants utilize two-stage units with intercoolers.

In two-stage compression the air is cooled between stages principally on account of the power saving thus obtained, but the moisture-removal feature of intercooling should not be ignored. A well-designed intercooler will condense a deal of moisture even though it operates at an intermediate stage in compression.

The operation of these coolers can best be visualized by referring to the curves of Figure 2. Each curve represents the pounds of water vapor in 1,000 cubic feet of *free* (atmospheric) volume at a given temperature before and after being compressed to various pressure. (This set of curves is not theoretically accurate under certain conditions, but gives results sufficiently correct for practical purposes.)

Zero pressure means atmospheric or compressor-intake condition. The curves either intersect the vertical zero line at the left or have the value of the i n t e r s e c t i o n point marked at the top. This gives the pounds of water vapor in 1,000 cubic feet of the mixture (as it comes to the compressor) at 100 per cent. relative humidity.

Assume that a compressor-intake temperature of 80 degrees F. and 70 per cent. relative humidity. From the curve for 80 degrees F. and 100 per cent. humidity the water would be 1.58 pounds per 1,000 cubic feet. At 70 per cent. humidity the water


Air discharged from compressor at 360° F. Contains 29.67 lbs. (3.56 gals.) of water vapor per hr.
Aftercooler
COMPRESSOR
450 c.f.m. Actual Free Air Delivery at 100 lbs. per sq. in. pressure.
Cooling water out
Cooling water in
CONDENSATE TRAP
RECEIVER
81% of the original water vapor or 2.88 gals. per hr. has been condensed by the aftercooler. Discharge air, cooled to 80° F., now contains only 5.67 lbs. (0.68 gals.) water vapor per hr.
80° F. Air at the Receiver and in the pipe lines contains 5.67 lbs. (0.68 gals.) water vapor per hr., but the temperature is normally below the pipe line temperature, therefore there is no further condensation.
CONCLUSION:-
Only 19% of the original water vapor (0.68 gals. per hr.) remains in the air to pass into pipe lines & tools, with practically no further condensation.
Compressor Inlet Air at 80° F., 70% relative humidity. 27,000 cu. ft. per hr. carries 29.67 lbs. (3.56 gals.) of water vapor per hr.

aftercooler (left) and with aftercooler.

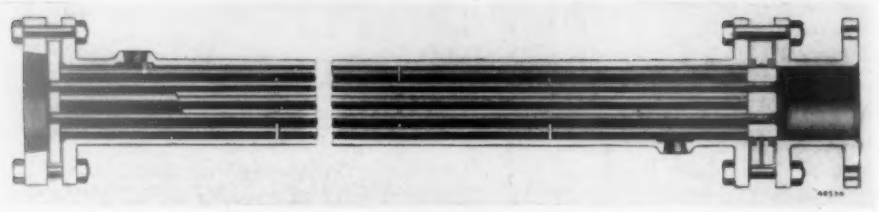


Figure 3. Counter-current aftercooler in which air flows through small tubes. Water flows around tubes, making several passes.

would be only 70 per cent. of 1.58 or 1.106 pounds for 1,000 cubic feet. The intercooler pressure on a two-stage unit will be about 28

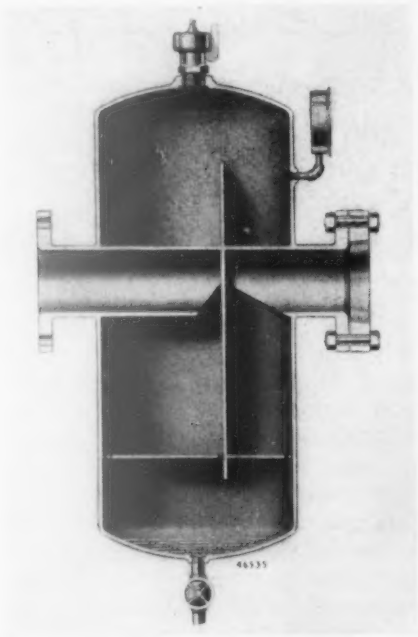


Figure 4. Separator to collect condensate formed in aftercooler. An automatic trap should be connected to the drain.

pounds and the outlet temperature will be assumed as 85 degrees F. The air is, of course, saturated at the cooler outlet. At this condition the curves show a water content of only 0.62 pound per 1,000 cubic feet. Therefore, the difference, or 0.486 pound per 1,000 cubic feet, has been condensed in the intercooler.

After compression in the second stage to 100 p.s.i. the air is cooled in an aftercooler to 80 degrees F., at which condition it can hold only 0.19 pound per 1,000 cubic feet. The condensate amounts to 0.43 pound per 1,000 cubic feet.

Therefore, in a two-stage 100-p.s.i. compressor under the assumed conditions, about 44 per cent. of the initial vapor content has been removed in the intercooler and 39 per cent. more in the aftercooler. Only about 17 per cent. of the original moisture can possibly be carried into the air lines. Note also that if the compressor were a single-stage machine, the aftercooler would condense the full 83 per cent.

Condensing the water and separating it from the air is only part of the solution. The condensate *must* be removed from the system. An automatic trap on each cooler is essential for this purpose. In addition, the receiver, into which the air flows from the aftercooler in every well-laid-out system, should be drained by hand at least once a shift. Traps are not usually installed on receivers, but that does not mean that the tanks need not be drained. Every effort must be made to see that the condensate does not go farther.

It is evident that the air should be cooled close to the temperature of the available water. It is therefore of the utmost importance that all the coolers be fundamentally correct in design.

Among these fundamentals are: (1) turbulence, that the air and water may have intimate contact with the tubes, and (2) counter-current flow, or an approach thereto.

On the shell side turbulence is usually obtained by the use of baffles and orifices, the latter to prevent dead spots. On the tube side velocities must be maintained above the critical velocity.

Counter-current flow may be obtained by parallel circuits in one shell as in the small cooler illustrated in Figure 3 or, as in Figure 5, by the use of two shells in series. Each shell in the latter case has multiple water passes to keep the velocity above the critical point. The basic circuit is however counter-current.

In the case of both intercoolers and aftercoolers the coldest available water should be used for economy as well as for greatest moisture condensation.

In spite of the fact that water is a natural associate of air as it comes to the compressor, proper compressor-plant equipment will eliminate a high percentage *before* it gets into the lines and most "water troubles" will disappear.

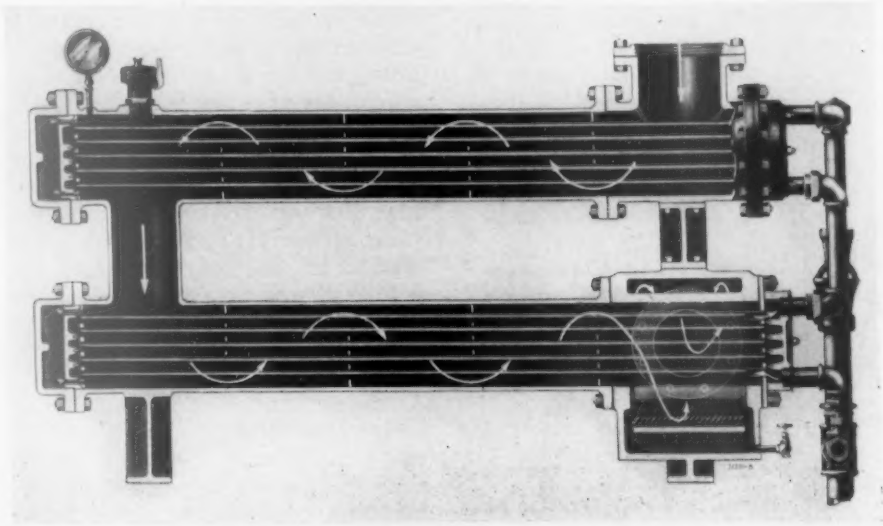


Figure 5. Typical aftercooler for larger installations. Note baffled air flow around tubes. Cold water enters lower nest of tubes first.

Sonntag Long Connected With Cement Industry

Among the veterans of the cement industry who died in 1943 was Carl H. Sonntag.

Shortly after the turn of the century he took a position as chief chemist of the old Bay Bridge Cement Company at Sandusky, Ohio. Later he was connected with the Kansas City, Bonner Brand, Great Western, and Cape Girardeau companies in Missouri and Kansas—names that have since been absorbed by present companies. In 1927 he went to Thomaston, Maine, to supervise construction of the Lawrence Portland Cement Company's plant and continued as its superintendent until 1939. Since his retirement in 1939 he spent some time in Venezuela and more recently had managed the new Ponce cement plant in Puerto Rico.

His death, at the age of 64, occurred in a hospital in Cleveland late in July of this year. He left his widow and two daughters to mourn his passing.

PERSONAL MENTION

L. N. Bryant

L. N. BRYANT and Mrs. Bryant are on their way to Hawaii where he will assume his new position as manager of the plant of the Hawaiian Cement Company at Waianae. This company is a subsidiary of the Hawaiian Gas Products Company and the first pilot section of the plant is expected to be operating in February, 1944. Mr. Bryant was formerly superintendent of the plant of the Green Bag Cement Company of Pennsylvania, Neville Island, Pittsburgh.

JOHN W. BRADBURY has been appointed assistant superintendent of the plant of the Green Bag Cement Company of Pennsylvania, Neville Island, Pittsburgh.

DONALD KEEL, formerly sales representative for the Federal Portland Cement Company in Buffalo has been promoted from captain to major at the Aberdeen Proving Ground, Maryland, where he has been stationed since January, 1941. He is now commanding officer in charge of several thousand recruits. He was graduated from Cornell University in 1936.

R. H. RODOLF has been appointed manager of the pump and compressor division of Gardner-Denver Company, Quincy, Illinois, following the death of R. J. MacFarland. Mr. Rodolf's connection with the company dates back to August, 1917, when he joined the Canadian Rock Drill Company at Vancouver, B. C., then a subsidiary of the Denver Rock Drill Manufacturing Company. In 1926, he was transferred to the St. Louis office as district manager.

HARRY H. SURPRISE, office and personnel manager of the United States Gypsum Company at Jacksonville, Florida, for more than two years and active in civic and social affairs there, has been promoted to assistant production manager for the company with headquarters in Chicago. J. V. TIMMONS, who has been connected with the Midland, California branch of the company will suc-

The Toughness of Manganese Steel *Reduces Scrap Metal in Crusher Parts*

Very hard metals used for crusher parts can often show a resistance to abrasion equal to that of manganese steel—for a while. But such castings, worn thin, are easily fractured and often must be replaced before full service is given.

Picture 3958 shows two worn Amsco manganese steel bowl liners and one mantle returned for scrap. Picture 3953 portrays new castings from the same patterns for the same cone crusher.

The new bowl liners weigh 7,800 lbs. each—which, against an average of 1,827 lbs. for the worn liners—show only 23½% scrap. The new mantle at 6,400 lbs. compared with the worn mantle at 2,046 lbs. gives a scrap ratio of 32%. All three castings were worn very thin *without fracture*, and were serviceable up to the moment when they were removed from the crusher. What metal other than austenitic manganese steel would resist breakage after being worn so thin in this severe service?

While it is not possible to guarantee any wear ratio because too many variable and uncontrollable factors enter into crushing operations, this performance is typical of manganese steel operating under the severest conditions of impact and abrasion. The maker of your crusher can tell you how best to apply "the toughest steel known" for lower maintenance cost, less scrap in wearing parts and more continuous production.

Bulletin 642-C describes many applications of manganese steel for crusher, grinding mill and pulverizer parts.

3958

3953

Amsco

AMERICAN MANGANESE STEEL DIVISION
Chicago Heights, Illinois

AMERICAN Brake Shoe COMPANY

FOUNDRIES AT CHICAGO HEIGHTS, ILL.; NEW CASTLE, DEL.; DENVER, COLO.; OAKLAND, CALIF.; LOS ANGELES, CALIF.; ST. LOUIS, MO.
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The "Fist-Grip" Clip Has 3 Strikes on Hitler

Saves accidents — can't be put on wrong; doesn't weaken rope; greater holding power.

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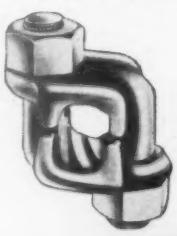
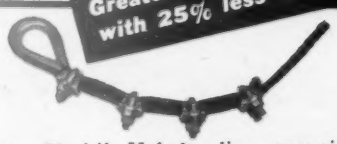


Greater holding power with 25% less clips!



"Finger-Pinch". U-bolt clips unavoidably crimp, distort and bow wire rope, causing reverse strains when load is applied.

"Fist-Grip". Fewer Safety Clips hold rope straight in smooth, vise-like grip, with no protruding threads to get battered in use. Clips and rope can always be used on the next job.

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THE THOMAS LAUGHLIN Company
PORTLAND, MAINE

Dean Rollans, vice-president in charge of sales, Wickwire Spencer Steel Company, announces the appointment of Charles B. Konselman, as advertising manager. Mr. Konselman succeeds George L. Randall, recently commissioned a Lieutenant (j.g.) in the Navy. Prior to joining Wickwire Spencer and for the past six years, Mr. Konselman was associated with the Royal Typewriter Company, the last three years of which as sales promotion manager.

ceed him at Jacksonville. Mr. Surprise has been connected with the United States Gypsum Company for seven years and went to Jacksonville from the East Chicago, Indiana, plant.

JOHN N. CRONK resigned as advertising manager for the Denver Equipment Company to join the advertising department of Commercial Solvents Company. He has been succeeded by WALTER L. SCHUMP, formerly with the Mine & Smelter Supply Company, Denver.

DAVID A. WEILL, electrical and mechanical engineer, is now associated with the Webber Equipment Company, New York.

OBITUARY

LION GARDINER, vice-president of the Jaeger Machine Company, Columbus, Ohio, and well known throughout the ready-mixed-concrete industry, died November 2 at his home in Columbus. He had been ill of a heart ailment for several weeks. Mr. Gardiner was a native of Cleveland and a 1909 graduate of the University of Illinois. He was football captain at Illinois in 1907 and for the past 30 years had served as an official in Western Conference games. He was a vice-president of the American Concrete Institute and served in an advisory capacity on the War Labor Board. Mr. Gardiner took a prominent part in the activities of the National Ready Mixed Concrete Association, was a regular attendant at its meetings, and had long served actively as an officer of its Manufacturers' Division.

BUD H. RADER, 64, widely known in the cement industry, died suddenly in his hotel apartment in Chicago on Sunday, November 7. Death was caused by a heart attack following an operation performed a week previously. In 1912 he went to Chicago as western sales manager for the Lehigh Portland Cement Company. Later he was made vice-president and held that position until his death. He was a bachelor and is survived by a sister, Mrs. Hattie Carden of Huntington, West Virginia.

HOMER LITTLEFIELD, 66, manager of the mining department of the Marion Steam Shovel Company, died suddenly at his home in Columbus, Ohio, on October 17. On May 16, 1924, he joined the company as manager of the mining division, which position he held at the time of his death. During this almost 20-year period Mr. Littlefield made business contacts with practically all of the operators in the United States engaged in open-pit mining.

HARRY P. ATWATER, 71, president of the South Dakota Cement Commission and mayor of Sturgis, South Dakota, died recently in a hospital at Sioux Falls, which he had entered several days prior for medical treatment. He was one of the state's outstanding trial lawyers.

CLINTON M. ROSS, 79, veteran stone quarry operator, died November 11 at his home in Buffalo of heart disease. He operated stone quarries in Buffalo's North Main Street section formerly known as Buffalo Plains. He supplied many large construction projects in that area with stone which was hauled by horse-drawn stone boats, since there were no trucks.

W. E. WOMBLE, rock buyer for the Missouri Pacific Railroad, died October 16 at his home in Fort Smith, Arkansas. He was well known all over the state of Arkansas by reason of his long contact with the railroad in buying ballast, aggregates and other materials for the road. He is survived by the widow and three sons.

WILLIAM ALLEN LESUEUR, prominent in the slate business for many years, died at his home in Richmond, Virginia, October 23. He entered the slate business in Buckingham County, Virginia, as a young man and in 1904 founded the LeSueur-Richmond Slate Corporation of which he was president until his death. He was also president of the Buckingham-Virginia Slate Corporation, a sales corporation organized in 1929.

GEORGE R. SHENBERGER, 65, an employee of the J. E. Baker Company, York, Pennsylvania, for nearly fifty years, died suddenly on October 8, 1943. At the time of his death he was secretary and general manager of the Baker company.

WILLIAM G. FITZPATRICK, vice-president of the Fitzpatrick Sand & Gravel Company, Auburn, Massachusetts, passed away on October 31.

Legal Decisions

By LEO T. PARKER

●

Public Contracts

It is well-established law that all persons doing business with public officials are bound to *know* the legal and lawful authority of such officials. However, modern higher courts hold that contracts, although not strictly lawful, are valid if the officials have for many years been making the same kind of contracts.

For illustration in Warren v. Police Jury of Washington Parish, 12 So. (2d) 643, it was shown that a seller for sand and gravel filed suit against a municipality to recover the sum of $649.60 for gravel and road material which was used for the improvement of the public streets. The counsel for the municipality contended that the municipal authorities had no valid authority to make the contract. However, the testimony proved that for twenty years the authorities had been making contracts of this nature. Therefore, the higher court held in favor of the seller and said:

"The point is that a public body which follows a custom of dealing with others in having certain of its work done, over a long period of years, is estopped, after that time, from claiming immunity because the work was done in a manner that was unauthorized by law."

Validity of Contract

"Consideration" in contract law results in many surprising adverse verdicts. Take for example, a late case in which the court held a rock company liable in damages because an official failed to realize that a mere promise on the part of one contracting party and *without a promise* on the part of the other party to "do something" does *not* result in a valid contract. The legal effect of this case proves that both contracting parties must agree to perform some kind of service, work, or benefit, otherwise that contract is void and ineffective.

In another case, a person named Brown owed $3,000 to a former employer named Wilson. The owner of a small plant desired the services of Brown, who refused to take the employment because he owed this money and believed that Wilson intended to attach his wages. Therefore, the owner of the plant entered into a contract to pay Wilson the sum of $3,000 owed by Brown. Later litigation resulted and Wilson sued the owner of the plant to recover the $3,000. However, the higher court held that Wilson was not entitled to a recovery and explained that the contract was not valid because Wil-

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was used in over 30,000,000 barrels of cement in 1942.

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2. **TDA gave appreciable savings in grinding media and power.**
3. **TDA has no *adverse* effect on *any* of the properties of portland cement.**
4. **When used in amounts greater than those generally recommended for grinding aid purposes, TDA noticeably improves many of the desirable properties of portland cement concrete.**

TDA *is not offered as a cure-all, but it may help you solve your grinding problems.* TDA, *with a ten-year record of successful and constantly growing acceptance, is now used in sixty-eight cement plants, a record which invites your consideration.* — Dewey and Almy Chemical Company, Cambridge, Massachusetts.

★

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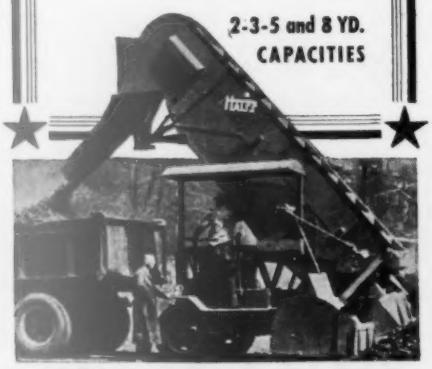
is in what it costs per yard per 100,000 yards. On that basis a HAISS will prove out to cost you less than anything else we know of . . . Write for catalog.

2-3-5 and 8 YD. CAPACITIES



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GEO. HAISS MFG. CO., INC.

HAISS

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son had not given any consideration. In other words, the owner of the plant had agreed to pay Wilson $3,000, but the latter had not agreed to perform any service, work or benefit for the owner of the plant.

Also, in Barlett, 271 Ill. App. 551 it was shown that a seller retained a lien for $3,000 on rock materials. Later a subsequent buyer of the merchandise promised to pay the holder of the lien $2,000. However, the lien was effective with respect to the first buyer and not to the latter buyer. Therefore, the higher court held the latter buyer not obligated to pay this $2,000 because no consideration had been agreed upon, as between the seller and the second buyer. This court said:

"Consideration is not injected into a contract by the fact that one or many considerations are available. The consideration must be selected by the parties."

Also, take for example another leading case in which a rock company agreed to pay compensation to a company employee who was injured while he was not working for the company but while he was doing work for his own benefit. In this, also, the higher court held the company not liable because there was no valid consideration, since the employee had neither done anything nor promised to do anything for the company.

On the other hand, in another late case a company official promised to pay a person a bonus of $1,000 each year if this person would leave his present employment and take employment with the company. In this case the court held the company obligated to pay the $1,000 because the company was benefitted as a result of the employee accepting the new employment and rendering valuable services to the company.

In other litigations involving contracts the courts have held that "consideration" of a contract need not be any special service or benefit, and a mere promise on the part of one party to do something is valid consideration, if the other party also promises or agrees to do something for the benefit of, or with respect to, the other contracting party.

When Contract Is Void

Many reasons are recognized as resulting in a contract being void. For example, both parties must be of legal age; the contract terms must be legal and not in violation to any federal, state, county or city law; and fraud of either contracting party will invalidate a sale contract.

For example, in the late case of Highland Company v. Heyburn Company, 35 S. W. (2d) 521, it was disclosed that a property owner contracted to pay a specified amount for excavating gravel. After the work was begun an old abandoned concrete and marble swimming pool was discovered and its removal necessitated a considerable amount of extra work and expense. The excavator sued to recover extra payment.

During the trial it was proved that the property owner was aware that the swimming pool was embedded in the gravel. Therefore, since the property owner had failed to notify the excavator of the hidden obstruction, the higher court held the former liable for extra payment above the contract price, and said:

"If the natural formations are different from what was expected by the excavator, he can not claim extra compensation because of the increased cost of doing the work. . . . Here we have hidden concrete and marble. . . . There was nothing to indicate the hidden obstruction. He was within his rights in assuming that the work of excavating would be determined by the character of

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Our engineers and construction crews are available for quick construction

E. C. MACHIN COMPANY
BUILDERS
Commonwealth Building—Allentown, Pa.

material which had been placed by nature."

Therefore, it is quite apparent that silence of either contracting party may represent fraud, resulting in a void contract, if such silence deceived the other contracting party.

Vehicle Tax Collectible

Generally, the owners of motor trucks used to deliver their own products are subject to payment of state taxes if the tax law is intended to include operators of trucks for compensation.

For illustration, in Consolidated Rock Products Company v. State, 135 Pac. (2d) 699, it was disclosed that a company is engaged in the business of selling rock, sand, gravel and ready-mixed concrete. It owns and operates trucks in which such materials are delivered to its purchasers.

Litigation arose over the legal question whether the company was obligated to pay to the state taxes under a law that imposed a tax of 3 per cent. of the gross receipts from the operation of motor vehicles by "operators." The law defined the term as follows: "The word 'operator' shall include all persons, firms, associations and corporations who operate motor vehicles upon any public highway in this state and thereby engage in the transportation of persons or property for hire or compensation, either directly or indirectly."

In holding the company liable for payment of the taxes the higher court said:

"We are satisfied that one who transports goods for sale and adds the transportation charge to his selling price is transporting those goods for compensation, at least indirectly. . . . Compensation for transportation service of either common or private contract carrier is direct compensation, and the very fact that the act expressly defines an operator as one who operates a motor vehicle for compensation, either directly or indirectly, supports the conclusion that the act was intended to have a wider application than to carriers alone."

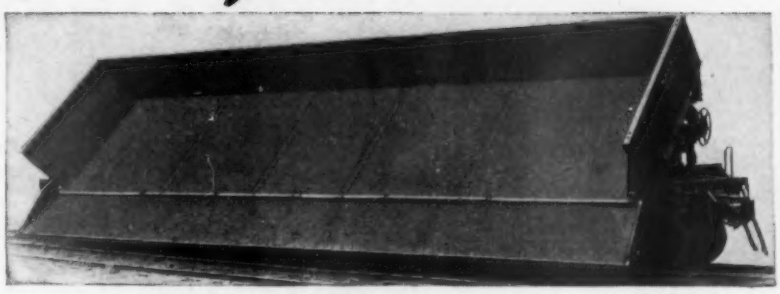
On the other hand, it is interesting to observe that this court held that an amount added to the selling price for delivery of goods to a buyer in trucks owned and operated by dealer, is not a "specific charge for transportation." Therefore, where a state law requires payment of taxation only where a specific charge is made for delivery of goods, the owners of trucks used to deliver sold merchandise are not required to pay the taxes.

War Cancels Lease

Modern higher courts hold that if a lease contract contains a clause specifying the kind of business conducted by the lessee the latter is relieved from further obligations and the lease is automatically cancelled by the enactment of governmental statutes, decrees or regulations which makes unlawful the further sale of the goods regularly sold by the lessee.

However, a change in the law during the term of the lease, which merely restricts but does not wholly prohibit the conduct of the business carried on, does not release the tenant from his obligation to pay rent. Furthermore, if the lease contract does not limit the kind of business conducted by the lessee, the lease contract remains valid.

For illustration, in Davidson v. Goldstein, 136 Pac. (2d) 665, it was disclosed that a property owner sued for rent due on a written lease made long before the United States entered into the present war. The only excuse the lessee had as to why he



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failed to fulfill the terms of the lease and pay the agreed rental was that the premises for the purposes for which the lease was made became unlawful, or at least unprofitable, by reason of certain regulations made by the federal government, under its war powers, regarding the sale of merchandise in which the tenant dealt.

However, since the lease did not specify the kind of business in which the lessee was enaged, or the kind of merchandise that he intended to sell, the higher court reversed the lower court which held the lease automatically cancelled. The court said:

"The lease contains no limitation of the uses to which the lessee may put the leased property. In the absence of such limitation, the tenant may use the property for a lawful purpose not materially different from that in which they are usually employed, to which they are adapted or for which they were constructed."

Also, see Grace v. Croninger, 12 Cal. App. (2d) 603, where property had been leased under a lease which limited the lessee to carrying on therein specified business. The court held:

"Where the contract does not restrict the use of the leased premises to a single purpose, it is not invalidated by a subsequent enactment prohibiting the use for less than all of the several purposes specified."

And the same question arose under the present war-time regulation stopping the sale of new automobiles except to those who can obtain rationing board certificates authorizing them to buy, in Byrnes v. Balcom, 38 N. Y. S. (2d) 801. The landlord sued to recover rent due on a lease, and the automobile dealer set up the regulation just mentioned as a defense. On this point the court said:

Undoubtedly the lease contemplated the sale of new cars on the premises but the lessee is not restricted to the exclusive sale of such cars but may devote the property to other legal uses specified in the lease. This is not a case where the parties entered into a lease exclusively for a use which was not illegal when the contract was made but which was subsequently made illegal by operation of law. . . . Respondent is not entirely prohibited by governmental decree from selling new cars. His right to do so is restricted."

Questions and Answers

[Mr. Parker will be glad to answer questions regarding legal problems of PIT AND QUARRY readers. Questions should be addressed to Leo T. Parker, Legal Editor, PIT AND QUARRY.—ED.]

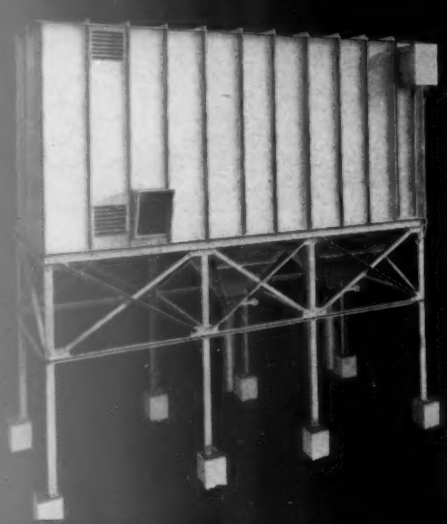
Legal Editor: How can an employee who died of silicosis prove his case and receive compensation under state laws? Also, when is an employer liable in damages—H. C.

Answer: In the case of *Schell v. Du Bois, Administrator,* 94 Ohio St. 93, the higher court held that the violation of a state statute by an employer is negligence which is directly and proximate to the cause of an injury, illness, or death. The decision in this case has been followed in many other higher courts. Moreover, any negligence of an employer entitles an employee to recover damages if the employee was not contributorily negligent and, also, the state laws permit an employee to elect to sue for damages or accept compensation under state laws.

The employee must prove that he suffered disability or his dependents must prove that he died as a result of silicosis. Otherwise no recovery is possible. In many instances the higher courts have held that proper testimony of attending physicians is sufficient to establish the employe's case.

For illustration, in the case of *Industrial Commission v. Warnke,* 2 N.E. (2d) 248, it was shown that

Control DUST!



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suit was filed by a widow to recover compensation under the Workmen's Compensation Act for the death of her husband. The testimony of the physician who attended the descedent in his illness was accepted by the court to prove the descedent's physical condition.

Also, in the case of *Lake Company v. Meyer* the higher court held that the length of time of exposure and the accuracy of an X-ray machine is a proper foundation for X-ray pictures used in evidence. However, this court held that if the picture is not identified it can not be properly admitted in evidence.

* * *

Legal Editor: We purchased certain equipment and made a down payment. Before delivery the government "froze" the sale. Can we get back our first payment, or do we have to wait until the government restrictions are lifted?—A. P. W.

Answer: Modern higher courts hold that when a federal law or regulation makes performance of an existing contract illegal, a purchaser who is *not* at fault may demand the return of the purchase price or any part thereof he may have paid for merchandise. See *Clarke*, 30 Atl. (2) 859, reported March, 1943, where a buyer sued a seller to recover certain money paid on the purchase price of equipment whose delivery was prevented by the government's new regulation. The purchaser sued the seller to recover the down payment he had made when the contract was signed, and the higher court promptly held the seller obligated to return this money.

* * *

Legal Editor: A certified operator hauled a load of material belonging to three shippers and told one of them that $2,000 insurance would cover the entire load. The second shipper was told that his goods would be covered by $2,000 prorated with the second shipper's. The third shipper's load was taken without specific agreement as to insurance. A total loss ensued to truck and cargo *en route*. The first shipper made claim for $4,800, the second for $2,050 and the third for $450. The carrier's tariff provides for $2,000 limitation of liability unless excess value is specifically stated and an extra charge is made therefor. What are the carrier's obligations and legal liabilities—W. & Co.

Answer: It seems the liability of a carrier under the circumstances mentioned would be $4,450. The carrier's tariff limits the liability to $2,000 for each shipper, unless extra charge is made, as you say. Of course, a different situation may arise if the goods belonging to the three owners were shipped by one shipper and the carrier did not know that the goods belonged to three different shippers. On the other hand, a controversy might include the statement that $2,000 insurance would cover the entire load. In other words, if the carrier, through negligence, prevented the shippers from obtaining full insurance coverage, or if the carrier agreed to fully insure the merchandise and failed to do so, the carrier may be liable for damages to the full value of the goods.

Legal Editor: When are employers and companies bound by guarantees and other statements made by their salesmen? A few weeks ago a salesman took our order and guaranteed delivery within three weeks. What recourse have we, as the goods have not yet arrived?—K. M. C.

Answer: An employer is bound by a guarantee made by a salesman: (1) If the employer has notified the purchaser that he will be bound by contracts, statements and guarantees made by the salesman.

(2) If in the past the salesman's employer has been in the habit of

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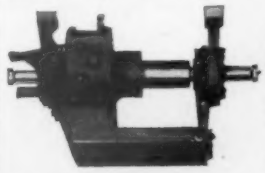
HERCULES SPLIT-SHAFT POWER TAKE-OFFS, inserted in the drive-shafts of these radically new fire-fighting units, transmit to the pumps the power of the truck motor. The result is a stream with three times the force ordinarily used, and the high-pressure fog thus distributed through the turret guns simply blasts away the flames and smoke.

We're glad that other Hercules products are doing their bit in destroying the enemy, but we're proud to have a part in building a unit which will save the lives of our own men.



Hercules Power Take-off for Truck-mounted Equipment

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STEEL PRODUCTS CO.
BUILDERS OF HERCULES HYDRAULIC HOISTS AND DUMP BODIES
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FARREL BACON
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Complete plants designed and equipped, including Screens, Elevators and Conveyors. Machinery for Mines and Rock Quarries, Sand and Gravel Plants. Engineering Service.

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filling orders and contracts made by the salesman. The court may infer that the salesman is authorized to make valid contracts under the latter circumstances.

(3) If the salesman practiced actual fraud, under which circumstances the employer is responsible although he did not expressly or impliedly authorize the salesman to perform the fraudulent acts, or make the fraudulent statement or guarantee. Accordingly, the company is bound by the guarantee if in the past its officials customarily made shipments in strict consideration of the salesman's orders and contracts and without approving them before valid contracts were completed.

* * *

Legal Editor: Recently a man purchased equipment to the value of $2,500 from a company in a distant city. The purchaser gave a mortgage for the goods and it was registered in this distant city by the seller. We would like to know:

1. Is a company holding a mortgage required to record it in any designated town or city, or may he choose to record it in the city where he does business.

2. To what extent outside our city must we search public records for evidence that there is a mortgage on equipment?—C. C.

Answer: It is well established that a mortgage properly recorded is effective against persons in *all* localities. In other words, the seller has a valid claim against the equipment, irrespective of whether the mortgage was recorded in your city. It is sufficient if this mortgage is recorded in the locality in which the sale was made. The mortgage is effective with respect to all persons and companies in the United States.

TRAFFIC News Digest

General Order 18-A issued November, 1943, by the Office of Defense Transportation cancels General Order 18 and includes special directions ODT 18 A-1—18 A-2 and 18 A-3. Loading requirements are substantially the same under the new order as under ODT-18 revised.

The Interstate Commerce Commission entered its supplemental report November 8, 1943, suspending the increased railroad freight rates which were originally suspended from May 5, 1943, to January 1, 1943, to a further suspension for the period to and including June 30, 1944. A number of state commissions also followed the same procedure.

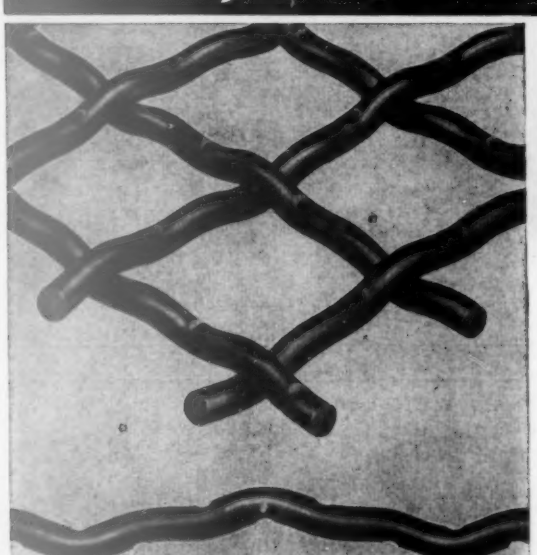
The national forecast of car requirements as issued by the Regional Shippers' Advisory Boards and compiled by the Car Service Division of the Association of American Railroads has just been released. For the fourth quarter of 1944 the forecast for the entire country indicates a decrease of 23.3 per cent. in loadings of sand, stone and gravel as compared to the fourth quarter of 1942. Lime and plaster loadings show a decrease of 4.2 per cent.

Trunk Line Association

Docket 41843 (shippers). Limestone, ground or pulverized, carloads, min. wt. 60,000 pounds, from Erie R. R. stations Index 1775 East Buffalo to 1820 Black Rock, New York, to Newark, Delaware, $2.92; Middletown, Delaware, $3.03; Dover, Delaware, $3.14; Laurel and Frankford, Delaware, $3.36 per net ton in lieu of current sixth-class rates. Reason: Comparable with rates from and to other points.

Docket 41854 (shipper). Lime-

Assuring ✔ Many extra hours of service ✔ Toughest resistance to wear



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Available in all standard weaves and sizes (special sizes are manufactured to order).

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stone, broken, crushed, ground or pulverized. Carloads, from Patterson, New York, to destinations in Vermont and stations on Narragansett Pier R. R. in Rhode Island and to stations in the state of New Hampshire, rates and specific destinations as per exhibits A and B, copies of which will be furnished on request. Reason: Comparable with rates from other points.

Docket 41863 (shippers). Limestone, ground or pulverized, and/or stone dust, carloads, min. wt. 60,000 pounds, from Kerns, Virginia, to Washington, D. C., $2.48 per net ton in lieu of present sixth-class rate.

Western Trunk Line Association

Docket E-43-165. Gypsum rock, ground, carloads, min. wt. 80,000 pounds, from Fort Dodge, Iowa,

To	Present	Proposed
Akeley, Minn.	$0.29	*$0.22½
Bagley, Minn.	.32	†.26
Bemidji, Minn.	.30	*.23
Cass, Lake, Minn.	.30	*.22½
Deer River, Minn.	.30	†.23½
Grand Rapids, Minn.	.30	†.22½
Black Duck, Minn.	.32	*.25
LaPorte, Minn.	.30	*.23
Little Fork, Minn.	.33	*.25

*Combination on Minneapolis, Minn., 13 cents to Minneapolis, Minn.

†Combination on Duluth, Minn., 16 cents to Duluth, Minn.

(By shipper)

Central Freight Association

Docket 74456 (2). Limestone, agricultural, unburnt, in bulk in open top cars, C. L. Established on, from Lewisburg, O., to points in Indiana, rates as shown in Exhibit A attached, via NYC RR (C) and via NYC (C), Losantville, Ind., C&O Ry.

Docket 74463 (2). Sand, as described in Exhibit B attached. Established on, to Hamilton, O., rates as follows:

From

So-called Vassar Groups, viz:

	Open Cars	Closed Cars
Juniata, Mich.	$2.53	$2.53
McHale, Mich.	2.53	2.53
Vassar, Mich.	2.53	2.53
Wampson, Mich.	2.53	2.53
Watrousville, Mich.	2.53	2.53
Millington, Mich.	2.53	2.53
So-called Paines Group, viz:		
Paines, Mich.	$2.53	$2.53
Hemlock, Mich.	2.53	2.53
Daytona (Black Siding), Mich.	2.64	2.64

Rates are subject to Ex Parte 148 increase, which is suspended until June 30th, 1944.

Docket 74634 (2). Limestone quarry waste (not suitable for building purposes), in bulk in open-top cars, c.l. min. wt. 90 per cent. of marked capacity of car except when car is loaded to full cubical or visible capacity, actual weight will apply. Established on, from North Vernon, Indiana, to Trenton, New Jersey, $4.18 per net ton.

Docket 74637 (2). Lime, fluxing and ground, in bulk, c.l., min. wt. 70,000 pounds. Established on, from Mosher and Ste. Genevieve, Missouri, to Pittsburgh, Pennsylvania. $3.18 per net ton.

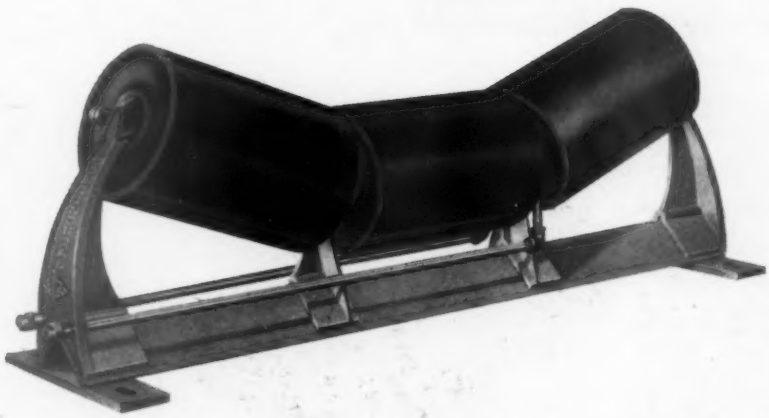
Docket 74641 (2) (a). Sand, all kinds, and gravel in open top equipment, carloads. (See Note); (b) Sand (except sand, moulding, bonded, naturally or otherwise) and except ground or pulverized sand, in open-top equipment, carloads. (See Note)—Established on, from Leetonia, Ohio.

	Descriptions	
To	(a)	(b)
Mingo Jct., O.	$1.10	...
Martins Ferry, O.	1.16	...
Weirton, W. Va.	...	$1.10
Aliquippa, Pa.	...	1.10

Proposed rates subject to ExParte

"Specify CONTINENTAL"

BELT CONVEYOR IDLERS



Alert operators are reducing their bulk material handling costs by installing Continental Belt Conveyors. Continental Idlers have what it takes—they are designed and built to do a real job. They will do your job better and cost no more than ordinary idlers. Crushed stone, cement, slag, sand, gravel and similar products are being handled daily for a few cents a ton via Continental Conveyors.

Continental Belt Conveyor Idlers are made in a wide range of types and sizes for all kinds of service, so if you contemplate a new conveyor installation or the replacement of idlers on old conveyors, be sure to thoroughly investigate Continental Idlers before you write your specifications.

Write today for a copy of Bulletin ID-103 so you can better judge for yourself the superior features of this Precision Built, Streamlined, Efficient CONTINENTAL CONVEYOR IDLER.

INDUSTRIAL DIVISION

CONTINENTAL GIN COMPANY

ATLANTA, GA. BIRMINGHAM, ALA. DALLAS, TEX. MEMPHIS, TENN.

MANGANESE CAST POINTS for SHARPENING Digger Teeth

Quick Economical Repair by Welding. Sharp Teeth Save Power. Immediate Shipment on M.R.O. Priorities.

Send for Bulletin PQ No. 47

ALLIED STEEL MANGO PRODUCTS INC.

ALLIED STEEL PRODUCTS, Inc.
N.B.C. BLDG. · CLEVELAND 14, OHIO, U.S.A.

148 increase (suspended). (*Note:* Rates will not apply as shipments in cars with tarpaulin or other protective covering. In such instances the rate applicable on shipments in box cars will be assessed.)

Docket 74643 (1). Lime, common, hydrated, quick or slaked, carloads—Establish on, from Manitowoc, Wisconsin, to Ashtabula, Ceico and Cleveland, Ohio, 21c. min. wt. 30,000 pounds; 17c. min. wt. 50,000 pounds, subject to Ex-Parte 148 (suspended).

Docket 74646 (1). Industrial sand in closed and open equipment. Cancel rates on, from Brazil, Indiana, to points in Illinois, Indiana, Michigan, Ohio, Wisconsin, Iowa, Missouri and Kentucky published on pages 40, 41 and 42 of B&O R. R. Trf. 3622-A, and similar rates in other individual lines' tariffs, account obsolete classification basis to apply in lieu thereof.

Illinois Freight Association

Docket IRC-511-120. Sand and gravel, carloads, as described in Item 150 of CRI&P Tariff 26061-P, min. wt. 90 per cent. of marked capacity of car, except when car is loaded to full visible capacity, actual weight will apply, but not less than 40,000 pounds, from Chillicothe, Illinois to B&O R. R. Illinois stations, viz.: Bradfordton, Farmingdale, Richland, Pleasant Plains, Gurney, Philadelphia, Virginia, Bluff Springs and Beardstown, Illinois. Present—Class or combination. Proposed, $1.25 per net ton.

Docket 511-121. Roofing granules, carloads, min. wt. 90 per cent. of marked capacity of car but not less than 80,000 pounds, from Chicago to E. St. Louis, Illinois, $1.98; Joliet, Illinois, $1.32; Lockport, Illinois, $1.32; Marseilles, Illinois, $1.44; Vandalia, Illinois, $1.90; Waukegan, Illinois, $1.06; Wilmington, Illinois, $1.32; being proposed rates per net ton. Present—Class rates.

Southern Freight Association

Docket 30573 (carrier). Publish rate of $7.78 per long ton on phosphate rock, crude, ground or pulverized, not acidulated or ammoniated, carloads, from Florida mines on A. C. L. R. R. and S. A. L. Ry. to Atlas, Missouri.

Southwestern Freight Association

Docket 32144 (2). Superphosphate, etc. Little Rock, North Little Rock and Texarkana, Arkansas, to Fort Smith, Arkansas. To establish rates of 11 cents per 100 pounds from Little Rock and North Little Rock, and 13 cents per 100 pounds from Texarkana, on superphosphate, ammoniated or not ammoniated, carloads, to Fort Smith, for application *via* routes of C. R. I. & P. Howe, Oklahoma, K. C. S. from Little Rock and North Little Rock and K. C. S. direct from Texarkana.

Record Tonnages in Screening Rock, Gravel & Ores Throughout the World

TY-ROCK SCREEN

Full Floating Circle-Throw Action for Coarse and Medium Sizes

Write for Catalog No. 65

THE W. S. TYLER COMPANY
CLEVELAND, OHIO

PERFORATED METAL SCREENS
FOR SAND, GRAVEL STONE, ETC.

Manufactured exactly to your specifications.

Any size or style screen, in thickness of steel wanted with any size perforation desired.
We can promptly duplicate your present screens at lowest prices.

Prompt Shipment

CHICAGO PERFORATING CO.
2435 W. 24TH PLACE CHICAGO, ILL.
Telephone CANAL 1459

NEW MACHINERY and SUPPLIES

● Bearing Metal

When the history of this war is written, one of its most exciting chapters will be industry's quick conversion to new materials, to replace those no longer obtainable. Behind industry's doors, there is turning up every day some new discovery that is revolutionary but little talked about.

The creation of silver babbitt, for instance, is a direct outgrowth of the shortage of tin, due to the war. The Battelle Memorial Institute of Columbus, Ohio, deserves credit for exhaustive research to find a babbitt metal that is comparable to tin-base babbitts. The ideal was to create a babbitt that would have the same bondability and corrosion resistance as that of tin-base babbitts and which would retain its hardness at operating

temperatures without squeezing out. The answer was found in silver alloyed with a properly balanced lead-base babbitt.

This new silver babbitt metal is now produced by National Bearing Metals Corporation, St. Louis, with the authorization of the Battelle Institute. Engineering briefs and a bulletin have been prepared by this company.

● Warning Signs

Promotion of plant safety without sacrifice of production speed or efficiency is the aim of a new series of safety signs prepared by the Towmotor Corporation, Cleveland, for display along lift-truck routes. The four signs are offered free to safety directors and other executives charged with plant efficiency.

Stepped-up production schedules and the bigger job of materials handling given industrial lift trucks have created the need for such signs, it is pointed out. Increased traffic flow in virtually all plants has these agile lift trucks on the job 24

One of the safety posters at upper left.

hours a day, handling virtually all types of material in quick shuttle trips between storage pile and assembly line. The lift trucks are powerful, handling as much as four-ton loads, yet versatile enough to turn on the proverbial "dime" along crowded assembly line routes.

The Towmotor safety signs offer quick, easily read warnings to both lift-truck operators and pedestrian employees, thu helping to insure safety, prevent lost-time accidents and consequent production lags. Bold letters carry such warnings as "Caution: Low Head Room," "Slow: Narrow Aisle Ahead," "Slow: Blind Corner," and "Stop: Crossing." Lift-truck routes are also indicated. The size of the signs is 14 by 22 inches, thus permitting easy display without visual interference.

Requests for these posters should be made to Towmotor Corporation, Cleveland, specifying the number desired.

● Tractor Loader

The tractor shovel shown in the accompanying illustration is the "Jayhawk" hydraulic front end loader for International tractors being manufactured by the Ottawa Steel Products Company of Ottawa, Kansas.

Tractor-shovel loading a gravel truck.

This new unit, which has a bucket capacity of ½ cubic yard and a lift of 8 feet is a fast-operating, sturdy outfit for loading trucks, hoppers, etc. It is of tubular construction and the bucket stops automatically when in the highest position. The loader unit, exclusive of the tractor, weighs about 1,100 pounds.

● Pump

An improved automatically-controlled valve is a distinctive feature of the new Type AO self-priming pump announced by Allis-Chalmers Manufacturing Company, Milwaukee. The design and operation of its valve arrangement is an important factor in the quick and effective priming action of this pump.

Priming of the Type AO pump is accomplished as the motion of the water throughout the pump runner and the volute passage carries behind it a slug of

To Sand+Gravel Operators—

TWO WAYS TO GET YOUR SHARE
OF THE ANNUAL
$15,000,000,000.00
POST-WAR CONSTRUCTION MARKET*

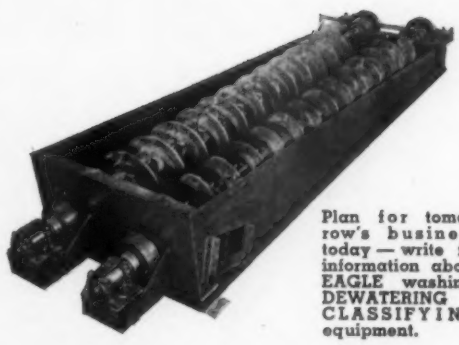
The cream of tomorrow's profitable business will go to those prepared to operate most efficiently—this means installing modern washing equipment.

Be prepared—with proper equipment—to meet increasingly rigid specifications, quickly and economically.

★$15 billion annually is the recommended expenditure of the American Road Builders' Association program. This includes all types of construction, not highways only. There is in addition a greatly increased demand for washed Railroad Ballast, which represents a large market.

Since 1872 EAGLE'S pioneering efforts in times of peace and war offer you a vast reservoir of experience from which to draw the solutions to your problems.

PLAN to PREPARE to PRODUCE.



Plan for tomorrow's business today — write for information about EAGLE washing, DEWATERING & CLASSIFYING equipment.

EAGLE IRON WORKS
DES MOINES, IOWA

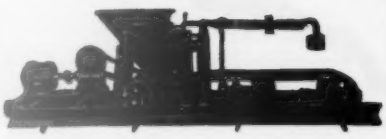
air, drawing air in the suction passage through the impeller and out through the priming chamber. This hydraulic action lifts the column of water in the suction line and achieves the same results as would a separate vacuum pump. The priming valve closes slowly during this process, acting against a spring tension which governs the rate of priming and the static height of the priming suction lift. The automatic closing of the valve after complete priming prevents water from bypassing back to the suction chamber, with resultant power loss.

The pump impeller has an unusually thick vane with rounded inlet edges, permitting the pump to pass stringy materials and fairly large solids.

The company plans a complete line of the self-priming Type AO pump, from 1- to 6-inch sizes, although only 2- and 3-inch sizes are ready for immediate sale. The entire line of pumps will range from a very small capacity to 1,400 g.p.m. and up to heads of 100 feet or over. The self-priming device incorporated in these pumps is also adaptable to use with other pumps, particularly the single-suction type. Further details may be obtained by writing the manufacturer.

Self-priming pump with automatic valve.

SCHAFFER POIDOMETER



Makes No Proportioning Errors

By their speed and accuracy in proportioning materials Schaffer Poidometers are playing an important part in the nation's titanic struggle for production supremacy.

Schaffer Poidometers are sturdy and strong. They can take the punishment imposed by increased wartime tempo—and like it.

If you have a proportioning problem —raw or finished materials—write for Catalog No. 5.

SCHAFFER POIDOMETER CO.
2828 Smallman St., PITTSBURGH, PA.

● Synthetic Rubber

A new synthetic rubber, the sixth major type to be discovered through chemical research, has been developed by the General Laboratories of United States Rubber Company, it was announced by Herbert E. Smith, president.

"Known as Uskol, this new synthetic will be used in both industrial and household products," Mr. Smith said. "As a result of its distinctive properties, it is expected to take its place alongside the present five commercial types of synthetic rubber—buna S, buna N, neoprene, butyl and thiokol.

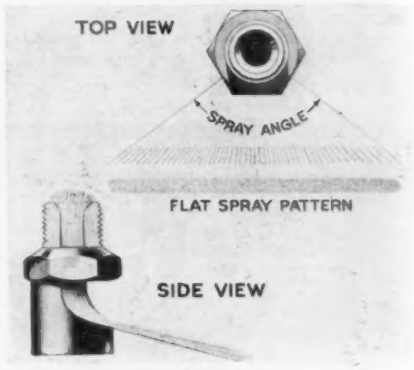
"Offering a new high degree of resistance to solvents, this new synthetic will be used in the manufacture of commodities which come into contact with fuels, oils, gasoline, dry cleaning fluids and other penetrating chemicals which are the enemies not only of natural rubber but of the other five synthetic types. It will also be used for specialties such as industrial molded items, tubing, gas and oil hoses, tank linings, and for application to paper and cardboard to render them resistant to grease, water and chemicals.

This new synthetic resulted from search for a rubber which would provide greater resistance to attack of high octane aviation gasoline. Its use will be limited to war products for the duration. It will be made by the company's chemical division at Naugatuck, Connecticut.

● Spray Nozzle

Wherever an exceptionally wide flat spray is required, this new flooding nozzle developed by Spraying Systems Company, Chicago, will prove extremely useful. Designed for use in spraying eliminator plates and similar applications, the flooding nozzle is available in brass and other standard materials.

As in all Spraying Systems' nozzles, surfaces of the new nozzle making contact with the water or other liquid sprayed are finely finished. Curved areas have been designed to produce the desired spray in the most efficient manner. With this flooding nozzle, a very wide angle spray may be obtained.



Illustrating the flat-spray nozzle.

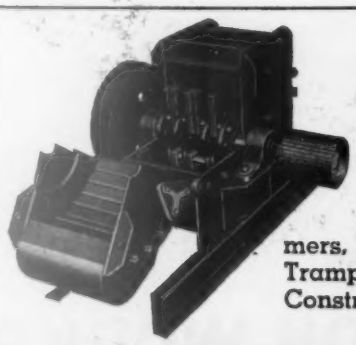
TRADE NOTES

The Associated Equipment Distributors, international association of construction machinery dealers, will hold its twenty-fifth annual meeting at the Edgewater Beach Hotel, Chicago, Illinois, January 17 to 20 inclusive.

The year 1944 is the silver anniversary year of the association. Since it was founded in 1920, originally as National Distributors Association of Construction Equipment, the AED has grown from a charter membership of a few firms to a present roster of 500 distributors and nearly 150 allied manufacturers. Nationally prominent speakers are being arranged for. Paramount problems of the industry, such as disposition of surplus government-owned construction machinery, contract termination and tax complexities, will be discussed.

For continued meritorious service on the production front, the American Foundry Equipment Company, Mishawaka, Indiana, has been awarded the White Star to be added to its Army-Navy "E" Production Award flag originally awarded on March 20, 1943.

The Stearns Manufacturing Company, Adrian, Michigan and the La-Plant-Choate Manufacturing Company, Inc., of Cedar Rapids, Iowa, recently had their Army-Navy "E" awards renewed for continued excellence in war production.



LET NEW HOLLAND HAMMER CRUSHERS INCREASE YOUR 1943 PRODUCTION ON FINER AGGREGATES AS WELL AS AGRICULTURAL LIMESTONE AND LOWER YOUR OPERATING COSTS. Features include Self Aligning Ball or Roller Bearings, Adjustable Hammers, Adjustable Breaker Plate, new design Tramp Iron Pocket and Welded Plate Steel Construction.

Write for Literature

NEW HOLLAND MACHINE CO.
NEW HOLLAND, PENNSYLVANIA

This Model W4-I MobiLoader, made by the Athey Truss Wheel Company, Chicago, and mounted on a Caterpillar D4 tractor is loading sand and gravel into dump truck in the pit of Alf. Cooper Construction Company, Fort William, Ontario.

The Thomas Laughlin Company of Portland, Maine, manufacturers of wire rope and chain fittings for the Navy and Merchant Marine has been awarded the pennant with one star which will shortly be flying above its Army-Navy "E" Award.

Trade Literature

VARIABLE SPEED CONTROL. 128 pages, (Catalog G-435). Reeves Pulley Company, Columbus, Indiana.

TYPE KC-KB-KA CIRCUIT BREAKERS. 20 pages, (Catalog 1301). I-T-E Circuit Breaker Company, Philadelphia.

SACO SPEED REDUCERS. 12 pages, (Catalog 643). Stephens-Adamson Manufacturing Company, Aurora, Illinois.

PIONEER JAW CRUSHERS. 24 pages. Pioneer Engineering Works, Minneapolis.

PREVENTING WELDING AND CUTTING FIRES. 16 pages. International Acetylene Association.

WHAT MAKES A GREASE? (Booklet). Sun Oil Company, Philadelphia.

SCHRAMM AIR COMPRESSORS. 16 pages. Schramm, Inc., West Chester, Pennsylvania.

WEMCO MILLING, Processing and Separation Equipment. 8 pages. Western Machinery Company, San Francisco.

B-W CONTROLS. 28 pages, (Catalog 943). B/W Controller Corporation, Birmingham, Michigan.

STOCK LIST AND REFERENCE BOOK. 244 pages. United States Steel Supply Company, Chicago.

BAKER BULLDOZERS AND GRADEBUILDERS. 8 pages, (Condensed Catalog 839). Baker Manufacturing Company, Springfield, Illinois.

CLIMAX GENERATING SETS. 24 pages. Climax Engineering Company, Clinton, Iowa.

LUBRICATION AND MAINTENANCE GUIDE FOR CONTRACTORS' EQUIPMENT. 64 pages. Gulf Oil Corporation, Pittsburgh.

MANGANESE STEEL FOR CEMENT MILL EQUIPMENT. 32 pages. American Brake Shoe Company, Chicago Heights, Illinois.

Army-Navy "E" awards were made recently to the following concerns:

Raybestos Division of Raybestos-Manhattan, Inc., Bridgeport, Connecticut; Ransome Machinery Company, Dunellen, New Jersey; Davey Compressor Company, Kent, Ohio; Barnes Manufacturing Company, Mansfield, Ohio.

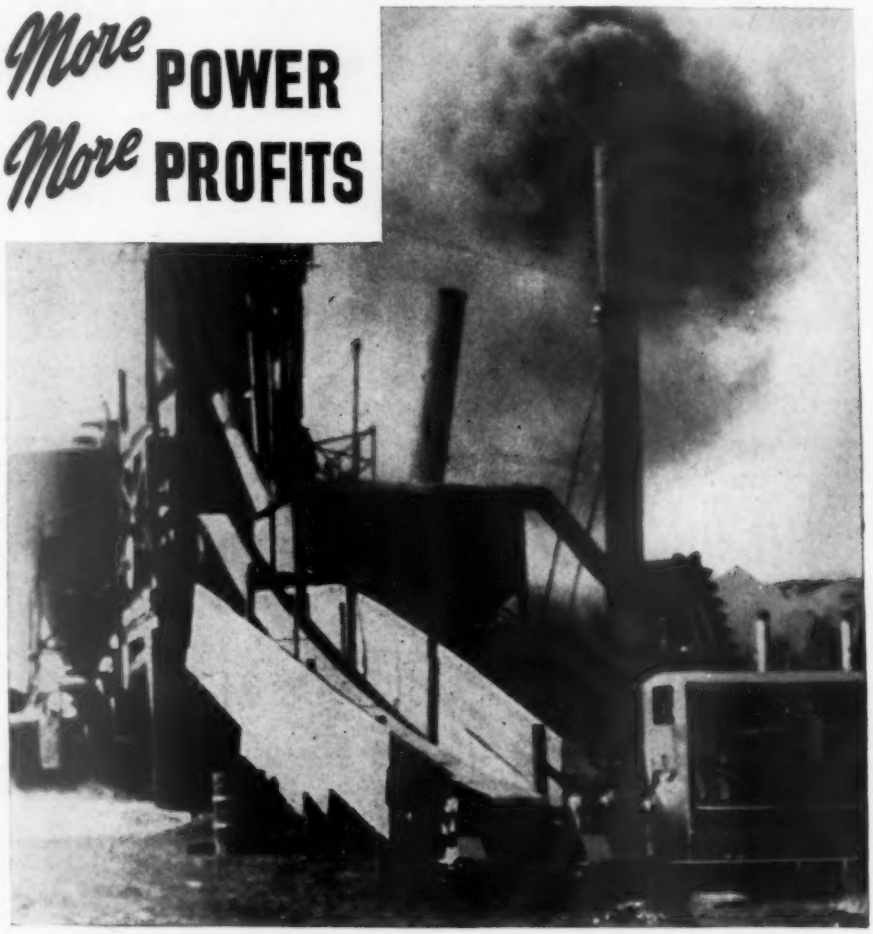
Stuart M. Christhilf & Company, Baltimore, distributor of equipment, has changed its address to 134 West Mount Royal Avenue.

The Link-Belt Company has purchased the manufacturing plant and inventory of Link Belt Supply Company in Minneapolis. The Link Belt Supply Company had worked very closely with the Link-Belt Company since around 1900, having in all this time served as an authorized distributor of Link-Belt Company products in Minneapolis, St. Paul, and the adjacent territory.

The Brooks Equipment & Manufacturing Company, Knoxville, Tennessee has opened a branch office and warehouse at Chattanooga. The address is 1410 Cowart Street. J. R. (Red) Johnson is district manager, and J. B. Ham, store manager.

The Nordberg Manufacturing Company has been awarded a third star for its Navy "E" pennant which was originally awarded this company in May 1942. It has also been awarded an additional star for its Maritime pennant which was given the company in May of this year.

More POWER
More PROFITS



For SAND and GRAVEL PLANTS

On the basis of superior performance, economy and dependability, Murphy Diesels have won their reputation for More Power, More Profits. Rugged, compact, lightweight, full-rated horsepower! ENGINE sizes: 90 to 215 HP; GENERATOR sizes: 60 to 115 KW., AC or DC.

★

Write for complete information.

BUY U. S. WAR BONDS

MURPHY DIESEL
Reg. U.S. Pat. Off.

MURPHY DIESEL COMPANY
5307 W. Burnham St., Milwaukee, Wis.

Jeffrey

Elevators
Feeders
Grinders
Idlers (belt)
Pulverizers
Portables
Screens
Transmission Machinery
Weigh Feeders

Chains
Car Pullers
Conveyors
Crushers

COVERS EVERY PHASE OF MATERIAL HANDLING — REDUCTION

Jeffrey offers a broad service to the stone products industry. The name stands for mechanical efficiency and the more difficult and varied the job, the greater the need for the diversified line of Jeffrey material handling and reduction units, capable of carrying through every step of the process.

The Jeffrey Manufacturing Company

(Established in 1877)

917-99 North Fourth Street, Columbus 16, Ohio

BALTIMORE · BIRMINGHAM · BOSTON · BUFFALO · CHICAGO · CINCINNATI · CLEVELAND · DENVER · DETROIT · HARLAN · HUNTINGTON · HOUSTON · MILWAUKEE · PITTSBURGH · PHILADELPHIA · NEW YORK · SCRANTON · SALT LAKE CITY · ST. LOUIS

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HOW TO PROTECT *VALUABLE EQUIPMENT*

BERGSTROM Electrodes deposit a layer of extra-tough metal over points of abrasion and impact. Thus they prevent premature wearing out of equipment. This saves valuable time and money.

These electrodes are easy to use. They can be applied in any position. Slag-free—chipping and brushing are eliminated. Several types—each designed to match a specific need for resistance to abrasion or abrasion and impact, also corrosion.

MANGALOY
—For welding manganese steels.

FLEXALOY
—A tough, hard overlay—unusually ductile.

RANALLOY TYPE "C"
—Low priced—for ordinar wearing conditions.

RANALLOY TYPE "A"
—Medium priced. Deposits tough, hard overlay metal.

RANALLOY TYPE "B"
—Super hardness for extreme abrasion resistance.

SUPRALOY
—Ultra hard rod. For maintenance of an edge or sharp corner.

COROSOLOY
—Corrosion-resisting rod.

BERGSTROM *Free Flowing*
HARD SURFACING ELECTRODES

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UNITED STATES STEEL SUPPLY COMPANY

CHICAGO (90) · BALTIMORE (3) · BOSTON (34
CLEVELAND (14) · MILWAUKEE (1) · NEWAR
(1), N. J. · PITTSBURGH (12) · ST. LOUIS (3
TWIN CITY-*St. Paul* (4)

UNITED STATES STEEL

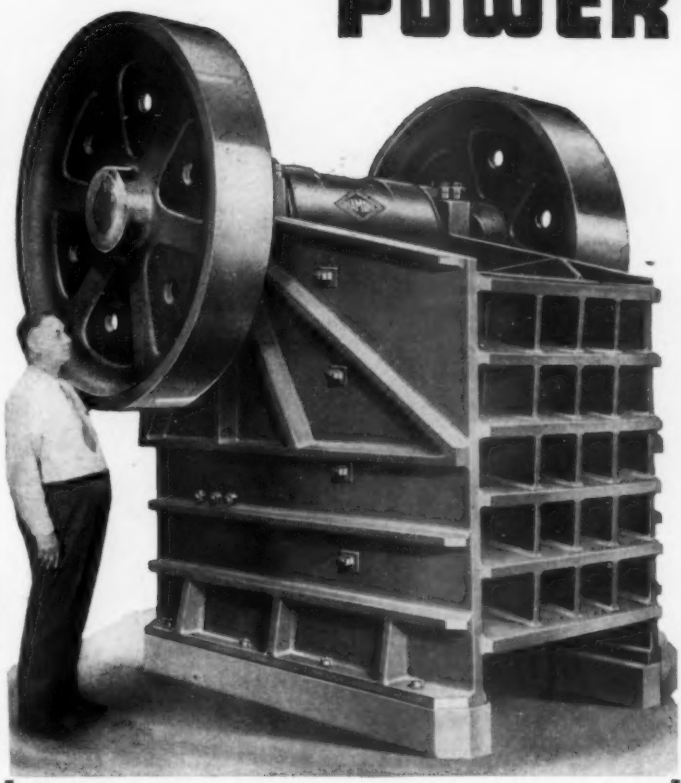
THIS OSGOOD "20"

. . . is clawing a military road out of the stubborn, tangled New Guinea jungle. Other Osgoods are at work every day in every war theater—"dishing it out" and "taking it"—in rock, hard clay, mud, snow and sand. And no job is too tough!

All this world-wide, campaign-proved performance hastens the day when Osgood ruggedness, power, maneuverability (Osgood measured air control) and complete dependability can again go to work for you. With that in mind, why not check with Osgood now!

THE OSGOOD COMPANY
Marion, Ohio

CRUSHING POWER



THAT SHATTERS PRODUCTION RECORDS

No matter how hard the rock, or how tough the production schedule, just put a DIAMOND Jaw Crusher of correct size on the job—and watch it deliver! It keeps the screens, conveyors and elevators running at capacity. Keeps the bins full—keeps costs per cubic yard or ton down—and profits up!

DIAMOND JAW CRUSHERS
GIVE GREATER TONNAGE PER RATED CAPACITY

DIAMOND "long jaw" design delivers greater tonnage per square foot of jaw area. It produces a maximum of desired size material and a minimum of undersize. Wide jaw openings assure fast feed and discharge. Oversize bearings stand up to the hardest rock and heaviest runs. The heavy reinforced structural steel base is electric welded. Made in 10 sizes for every primary crushing need. Ask for BULLETIN D-43-D.

Jaw Crushers—
Roll Crushers—
Hammermills—
Screens

DIAMOND

Conveyors—
Bins—Feeders
—Portable and
Stationary
Plants

Ask for new Quarry Plant Bulletin D-43-A

DIAMOND IRON WORKS, INC.
ESTABLISHED 1880
AND THE MAHR MANUFACTURING CO. DIVISION

1801 SECOND ST. N., MINNEAPOLIS 11, MINN.

YOU'RE RIGHT ! ! !

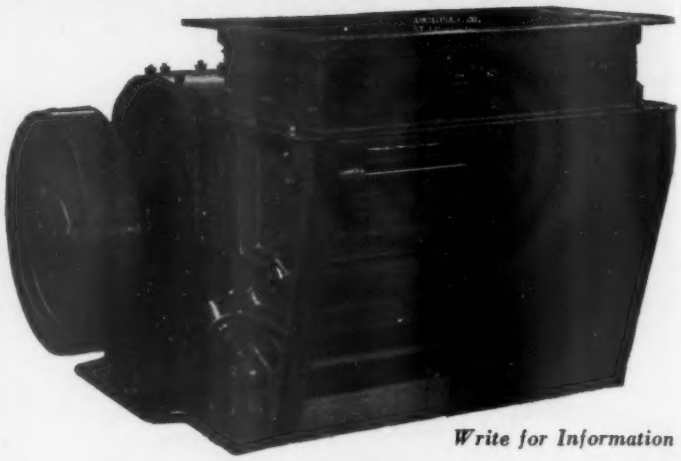
when you install SIMPLICITY GYRATING SCREENS. You are guided in your selection by overwhelming proof of superior performance and economies due to the Positive Action—Rubber-cushioned Power—Low Upkeep—Ruggedness —Elimination of Blinding, etc. No job too exacting for the SIMPLICITY GYRATING SCREEN—It is backed by result records that mean better profits regardless of service requirements.

Rewashing Gravel over 3' x 6' Single.

Simplicity Engineering Co.

DURAND . . . . . MICHIGAN

MEET WARTIME EMERGENCIES



Write for Information

WITH WARTIME EFFICIENCY

Today a crushing unit is expected to operate longer hours and with less breakdowns than ever before. American Crushers are built to take punishment and give good results. No need to worry if you have an American Crusher on the job, it surpasses all requirements.

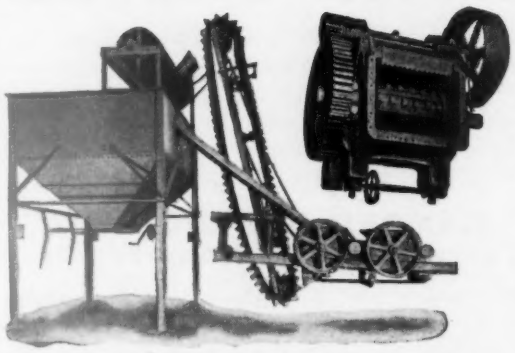
AMERICAN PULVERIZER CO.

1059 Macklind Ave. St. Louis, Mo.

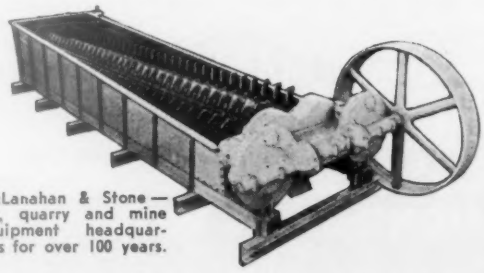
McLANAHAN

SCREENS • CRUSHERS

COMPLETE PLANTS



McLanahan equipment will prepare your plant for more business. Single and double roll and jaw crushers, hammermills, super dry pans—steel log washers and scrubbers, sand drags, revolving and vibrating screens, elevators, conveyors, dryers, jigs and hoists—complete portable, semi-portable and stationary crushing, screening and washing plants for different capacities of any material.



McLanahan & Stone—pit, quarry and mine equipment headquarters for over 100 years.

McLanahan & Stone Corp.

Established 1835
HOLLIDAYSBURG, PENNSYLVANIA

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Refer to the listings in the Broadcast Section in this issue for a wide variety of used and surplus machinery and supplies.

DECEMBER, 1943

The CONCRETE MANUFACTURER

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MANUFACTURING CO. - ADRIAN, MICH.

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The CONCRETE MANUFACTURER

DECEMBER, 1943

A SPECIAL SECTION OF PIT AND QUARRY DEVOTED TO PRODUCTION MARKETING AND USES OF CONCRETE PRODUCTS AND READY - MIXED CONCRETE

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Concrete Masonry Walls Shield X-Ray Workers

Thick, earth-filled concrete-block walls are used to shield operators of X-ray equipment, instead of thick layers of lead used normally for such purposes in the new Ohio State University X-ray research laboratory at Columbus. Because of the high frequency of the equipment, the lead lining of rooms housing the machines would have had to be 12-inch thick, which meant that several tons of the critical material would have been required. Alternatives considered and rejected as less desirable or more expensive than the earth-filled concrete walls were: housing the equipment below ground; or housing it within solid concrete walls of sufficient thickness to give protection against the X-rays.

The building is one story in height and for the most part windowless. Floors are plain concrete slabs; walls, other than the earth-filled ones, are plain concrete block, and the roof is a concrete slab covered by built-up roofing.

The earth-filled walls around the two rooms housing the X-ray equipment have a minimum thickness of 5 feet. The inner and outer faces of these walls are of 12-inch concrete block. Between these faces 3 feet of earth fill was added. Since the operators are to be in the neighborhood of the equipment for long periods, they are given greater protection, the walls separating their room from the equipment being 10 feet thick. Entrances to the rooms housing the equipment are shielded by earth-filled walls.

After the concrete-block walls had been carried to their full heights, the earth fill was added with a clamshell bucket handled by a truck crane. Ordinary earth in a fairly dry condition was used. It was compacted in place by hand.

To permit the operators to observe the progress of test operations without entering the experimental rooms, observation windows of a special type are built into the walls. Each window consists of a 4-inch diameter pipe closed at each end with a ½-inch thick plate glass plug and filled with clear water. Thus, the operator may observe the experiments through a 10-foot thickness of water.

The roof consists of a 12-inch reinforced-concrete slab covered by a 3-ply, built-up roofing. After the roof had been completed the exterior walls were given two coats of waterproof tinted stucco. Inner faces of the walls were left unfinished.

The building was built by Ohio State University at a total cost exclusive of equipment of about $18,000. Howard Dwight Smith, university architect, prepared the plans and his office supervised construction. The Trapp Carroll Company, Columbus, was the contractor.

Prices Revised Upward in Minneapolis, Atlanta

Concrete - block prices increased from 16 to 17 cents, delivered, in Atlanta recently.

In Minneapolis, ready-mixed-concrete producers have raised the price to consumers 25 cents per cubic yard. For a 1:2:4 mix in quantities over 50 cubic yards, the current quotation is $7.35.

Heavy Concrete Units Used to "Trim" Ships

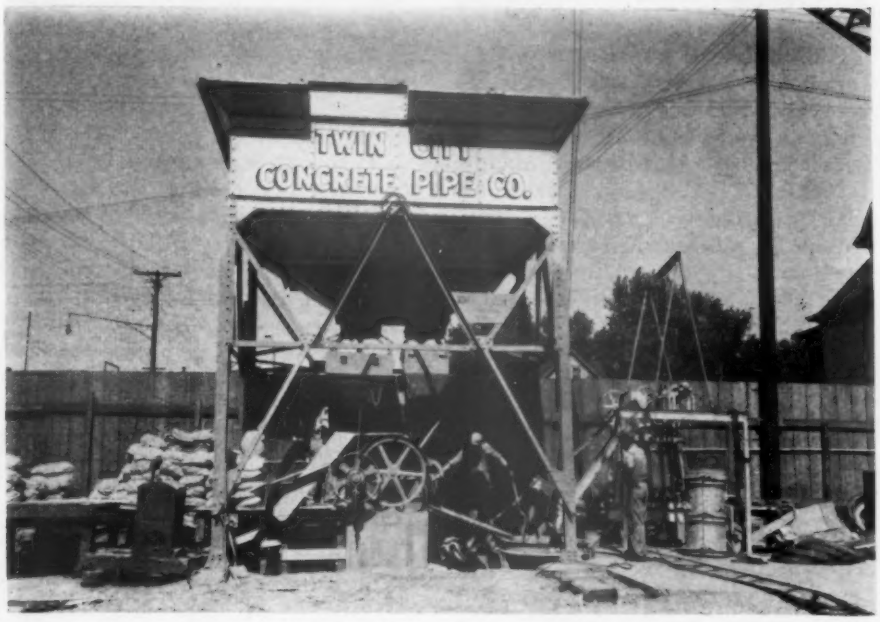
The Reardon Cement Company, Cincinnati, is helping Uncle Sam's armed forces in carrying out the first rule of the sea, "trim the ship."

Because anti-aircraft guns which, with their surrounding fences may weigh up to 500 tons, are mounted above the center of gravity where they can get the best bead on enemy planes, a serious problem in stability and ballast was presented.

With the shortage of pig iron and steel billets, the War Department and the Maritime Commission looked for other ballasting materials. The Reardon Company offered a solution with "heavy" concrete now being manufactured from the waste from a lead smelter. By mixing crushed lead waste with Portland cement and quartz sand, its engineers created a mix twice as heavy as ordinary concrete, and which can be molded to any shape needed and made up to any specifications on short notice.

The company formed a subsidiary, Ocean Ballast Company, and opened a plant in New Orleans, where the ballast blocks of concrete are being manufactured.

Former Transporter Erects Own Plant to Produce Concrete Pipe



General view showing bins, batcher, mixer and pipe machine.

ONE of the latest additions to the already long list of concrete-pipe manufacturers is the Twin City Concrete Pipe Company of Minneapolis. This progressive organization is headed by Joe Lambert, whose Lambert Transfer Company has been doing general contract hauling for 22 years. He also operates the Truck Crane Service Company, which contracts to do excavating, loading and handling work of all kinds. It was Mr. Lambert's many years of experience in hauling and placing concrete pipe for other manufacturers which finally led him to go into this business and erect a plant which went into operation in May, 1943.

Concrete bucket pouring a pipe form. Note vibrator on form.

The present plant is a small one and is located in a corner of the yard at 215 Second Street, S. E. It is now being operated at capacity to supply the demand for airports, army camps and other war projects in this area. Later, when equipment is available, the yard and plant will be expanded. Among other things an overhead traveling crane will be installed to do all the handling of forms and pipe.

At present the aggregates—sand and gravel—are dumped from trucks into piles from which they are transferred into a 2-compartment Butler steel bin by a Lorain truck crane using a clam-shell bucket for this purpose. This machine is one of a number owned by the Truck Crane Service Company. Batchers under the bin are used to measure the aggregates into a 12-cubic foot Besser concrete mixer and cement is added from sacks.

The concrete is discharged from the mixer to the drag-chain conveyor of the Quinn Type D double-tamper pipe machine. This will make either tongue-and-groove or bell-and-spigot pipes in any sizes up to 36 inches in diameter. The pipe machine and

(*Continued on page* 94)

Truck-mounted crane which handles concrete bucket.

The pipe yard showing some of the finished units.

Suggested Building Code For Masonry

THE Cement Products Bureau of the Portland Cement Association has recently revised its suggested building-code provisions for masonry. Concrete-products manufacturers, interested in the passage of local building codes which will give their product at least an even chance with competitive materials, will find these provisions of considerable value in the event new or amended codes come up for action in their own communities. The suggested code follows:

Masonry Construction. — All masonry construction shall conform to these building-code provisions and in all cases shall be of sufficient thickness to keep the stresses in the masonry within the working stresses prescribed.

Tests of masonry materials may be required at reasonable intervals to determine whether they conform to these requirements. Such tests shall be made in accordance with the standards prescribed for each material.

Masonry Materials.—All brick of clay, shale, sand-lime, or concrete shall be of a quality at least equal to that required by American Society for Testing Materials Specifications C62-41T for clay or shale brick, C73-39 for sand-lime brick, or C55-37 for concrete brick. When exposed to the ground or weather, the brick shall be of at least Grade MW for clay, shale or sand-lime brick; or Grade A for concrete brick.

All concrete units shall be of a quality at least equal to that required by American Society for Testing Materials "Specifications for Hollow Load-Bearing Concrete Masonry Units" (C90-39) or "Specifications for Solid Load-Bearing Concrete Masonry Units" (C145-40) when used for bearing walls or piers, or when exposed to the ground or weather; or equal to "Specifications for Hollow Non-Load-Bearing Concrete Masonry Units" (C129-39) when used for non-bearing purposes and not exposed to the weather.

All hollow clay tile shall be of a quality at least equal to that required by American Society for Testing Materials "Specifications for Structural Clay Load-Bearing Wall Tile" (C34-41) Grade LB when used for bearing walls or piers, or Grade LBX when exposed to the weather or soil; or equal to "Specifications for Structural Clay Non-Load-Bearing Tile" (C56-41) when used for interior non-load-bearing purposes; or equal to "Specifications for Structural Clay Floor Tile" (C57-39) when used for floor construction.

All cast stone shall be of a quality at least equal to that required by "Specifications for Cast Stone" (P3-A-29T) of the American Concrete Institute.

Cast-in-place concrete construction reinforced only for shrinkage or temperature changes shall be classed as plain concrete. Plain concrete, other than fill, shall conform to the requirements for reinforced concrete and have a minimum ultimate compressive strength at 28 days of 2,000 pounds per square inch.

All natural stone shall be sound and free from loose or friable inclusions, with sufficient strength and durability for the proposed use.

All architectural terra cotta shall have a strong homogeneous body and give a sharp, metallic, bell-like ring when struck. All units shall have the necessary anchor holes and shall be so formed as to properly engage with the supporting structure.

All glazed building units shall be of a quality at least equal to that required by American Society for Testing Materials "Specifications for Glazed Building Units" (C126-39T), except that the requirements for finish shall not apply to salt-glazed building units.

All gypsum partition tile or block shall be of a quality at least equal to that required by American Society for Testing Materials "Specifications for Gypsum Partition Tile or Block" (C52-41).

All structural glass block shall be precoated with a material to improve adhesion on all mortar bearing surfaces.

Mortar. — Cementitious materials used in mortars shall be of a quality at least equal to the quality of materials required by the following applicable specifications of the American Society for Testing Materials:

"Quicklime for Structural Purposes" (C5-26).

"Hydrated Lime for Structural Purposes" (C6-31).

"Hydraulic Hydrated Lime for Structural Purposes" (C141-42).

"Natural Cement" (C10-37).

"Masonry Cement" (C91-40).

"Portland Cement" (C150-42).

"Gypsum" (C22-41).

Aggregate for mortar shall be of a quality at least equal to that required by American Society for Testing Materials "Specifications for Aggregate for Masonry Mortar" (C144-42T).

Water used in mixing mortar shall be clean, and free from deleterious amounts of acids, alkalies, or organic materials.

The volume of aggregate in mortar shall be at least two times but not more than three times the volume of cementitious material.

Mortar used in masonry construction shall be classified as follows:

Type	Minimum compressive strength of 2-in. cubes at 28 days, (*pounds per square inch*)
A	2,500
B	600
C	200
D	75

Mortars of the following proportions, with the aggregate measured in a damp, loose condition, may be assumed to meet the strength classification given above.

Type	Proportions (*by volume*)
A	1 part of Portland cement and not more than 3 parts of aggregate with an addition of hydrated lime or lime putty of not more than 25 per cent. of the cement.
B	1 part of Portland cement, 1¼ parts of hydrated lime or lime putty, and not more than 6 parts of aggregate.
C	1 part of Portland cement, 2½ parts of hydrated lime or lime putty, and not more than 9 parts of aggregate. 1 part of masonry cement and not more than 3 parts of aggregate.
D	1 part of hydrated lime or lime putty and not more than 3 parts of aggregate.

When it is desired to establish the classification of a mortar by test, the test cubes shall be molded, cured and tested for compressive strength as described in American Society for Testing Materials "Specifications for Masonry Cement" (C91-40), except that for straight lime mortars the entire curing shall be in laboratory air at 70 deg. F. ± 5 deg., and with the further exception that for all mortar samples prepared in the laboratory the initial flow shall be between 100 and 115 per cent.

Masonry shall be laid in Type A, Type B, or Type C mortar, except as follows:

Type A mortar shall be used in nominal 10-inch cavity walls, foun-

dation walls or hollow masonry units, and masonry linings of existing masonry walls.

Type A or Type B mortar shall be used in footings, foundation walls of solid masonry units, isolated piers, load-bearing or exterior walls of hollow masonry units, hollow walls of masonry, parapet walls, and cavity walls exceeding nominal 10-inch thickness.

Type D mortar may be used in solid masonry walls, other than parapet walls or rubble stone walls, not in contact with the soil and not less than 12 inches thick nor more than 35 feet in height, provided the walls are laterally supported at intervals not exceeding 12 times the wall thickness.

Gypsum partition tile and block shall be laid in gypsum mortar, composed of 1 part gypsum to not more than 3 parts sand by weight. Nonbearing partitions and fireproofing of structural clay tile may be laid in gypsum mortar. Fire brick shall be laid in fire clay or air-setting mortar.

Glass block when laid in mortar shall be laid in Type B mortar.

Working Stresses.—Unless otherwise determined, the working stresses in masonry meeting the minimum requirements of this code shall not exceed the following.

Unit	Working stress (*lb. per sq. in., gross area*) Type of mortar			
	A	B	C	D
Brick				
4,500 lb. per sq. in.	250	200	150	100
2,500 lb. per sq. in.	175	140	110	75
1,500 lb. per sq. in.	125	100	75	50
Concrete Units				
Solid				
Type A	175	125	80	
Type B	125	100	60	
Hollow	85	70		
Clay tile	85	70		
Rubble stone	140	100	80	
Stone ashlar	400	320	250	160
Cast stone	400	320	250	160
Cavity walls				
Solid units	125	100		
Hollow units	60	50		

Plain concrete—0.25 times the ultimate strength.

Minimum Thickness.—The minimum thickness of bearing walls of masonry shall be 12 inches for the uppermost 35 feet of their height and shall be increased 4 inches in thickness for each successive 35 feet or fraction thereof measured downward from the top of the wall including foundation walls where the space within them is excavated; except that the top-story wall of a building not exceeding three stories or 35 feet in height may be 8 inches thick provided that it is less than 12 feet high and the roof beams are horizontal; except that walls of residential buildings not exceeding three stories or 35 feet in height may be 8 inches thick; and except that walls of one-story single-family dwellings and private garages may be 6 inches thick when not greater in height than 9 feet, with an allowance of an additional 6 feet for gables.

Cavity walls and hollow walls of masonry units shall not exceed 35 feet in height and 10-inch cavity walls shall not exceed 25 feet in height. In cavity walls neither the facing nor the backing shall be less than 3¾ inches in thickness and the cavity shall be not less than 2 inches nor more than 3 inches in width.

Rubble stone walls shall be 4 inches thicker than required for other masonry walls of the same height but in no case less than 16 inches.

Non-bearing walls may be 4 inches less in thickness than required for bearing walls but shall be not less than 8 inches thick except where 6-inch walls are specifically permitted.

Masonry walls above roof level inclosing stairways, elevator shafts, penthouses or bulkheads may be 8 inches thick when 12 feet or less in height, and shall not be considered as increasing the height or thickness of the wall below.

The height of a masonry wall or bearing partition between successive floors or other substantial lateral supports shall not exceed 20 times its thickness for solid masonry, 18 times its thickness for hollow masonry and hollow walls of masonry, nor 14 times its thickness for cavity walls unless it is reinforced by adequate cross walls, piers or buttresses at these intervals.

Non-Bearing Partitions.—All nonbearing partitions of masonry shall be built solidly against floor and ceiling construction below and above, and shall not exceed the following unsupported heights.

Thickness exclusive of plaster (*inches*)	Maximum unsupported height (*feet*)
2	9*
3	12
4	15
6	20
8	25

*Not over 6 ft. in length.

Foundation Walls. — Foundation walls shall be not less in thickness than the walls immediately above them and in no case less than 12 inches for unit masonry walls, or 8 inches for cast-in-place concrete walls, except that solid masonry walls extending not more than 5 feet, and hollow walls of masonry or walls of hollow units extending not more than 4 feet below the adjacent finished ground level may be 8 inches in nominal thickness. These depths may be increased to a maximum of 7 feet with the approval of the building official when he is satisfied that soil conditions warrant such an increase.

Foundation walls of cast-in-place concrete when supporting one-story basementless structures may be 6 inches thick if the total height of the foundation wall and the wall supported is within the allowable height of 6-inch walls.

Footings.—All foundation walls, piers and columns shall rest on footings having a horizonal area at the bottom such that the safe carrying capacity of the soil shall not be exceeded. The thickness of the footing shall be not less than two times its projection from the face of the wall. The bottom of all footings shall extend below frost level except for one-story accessory structures not over 1,000 square feet in area.

Fire Walls.—Fire walls shall have a minimum fire-resistance rating of 4 hours in addition to conforming to the other provisions of this section.

Party Walls.—Party walls shall conform to the requirements for interior walls provided that when exposed to the weather they shall meet the requirements for exterior walls or be covered with an approved weather-resistant material.

Parapet Walls. — Parapet walls shall be provided on all fire walls, party walls, and exterior walls of masonry or reinforced concrete where such walls connect with roofs of combustible construction making an angle of less than 20 degrees with the horizontal, except that a para-

pet shall not be required on walls facing a street 50 feet or more in width, or 50 feet or more distant from all property lines and other buildings on the same property, nor on the walls of a one- or two-family dwelling, or a building not exceeding 1,000 square feet in area.

Parapet walls shall be not less than 8 inches thick, nor shall the height be more than four times the thickness unless properly reinforced. They shall extend at least 12 inches above the roof for residential buildings not more than three stories high and at least 32 inches above the roof for other buildings. They shall be properly coped with incombustible, weatherproof material.

Bond.—There shall be a header course in all brick walls at least every seventh course on both sides of the wall or there shall be at least 1 full-length header in every 100 square inches of wall surface.

When 2 or more hollow units or solid units exceeding brick size are used to make up the thickness of a wall, the inner and outer courses shall be bonded at vertical intervals not exceeding 34 inches by lapping at least 3¾ inches. Hollow masonry units shall have full mortar coverage of the face shells in both the horizontal and vertical joints.

Brick facing shall be bonded to walls of solid or hollow masonry units, with at least 1 full header course in every 7 courses, or with at least 1 full-length header in every 100 square inches of wall surface.

Ashlar facing of either natural or cast stone shall have at least 20 per cent. of the superficial area extending not less than 3¾ inches into the backing to form bond stones, which shall be uniformly distributed throughout the wall. Every projecting stone, and, except when alternate courses are full bond courses, every stone not a bond stone shall be securely anchored to the backing with substantial noncorrodible metal anchors with a cross section of not less than 0.2 square inches. There shall be at least 1 anchor to each stone and not less than 2 anchors for each stone more than 2 feet in length and 3 square feet in superficial area. Facing stones not over 12 square feet in area shall have at least 1 anchor to each 4 square feet of superficial face area.

Facing shall be counted as part of the required wall thickness and the working stress shall be that allowed for the weaker material.

Veneered walls shall have the veneer tied into the backing either by a header for every 300 square inches of wall surface and extending at least 3¾ inches into the backing, or by substantial noncorrodible metal wall ties spaced not farther apart than 16 inches vertically and 2 feet horizontally. The veneer shall not be counted as part of the required wall thickness and shall not exceed 35 feet in height above approved supports.

Cavity walls shall have a $\frac{3}{16}$-inch noncorrodible steel rod or metal tie of equivalent stiffness placed in the horizontal joints, for each 3 square feet of wall surface. Additional bonding ties shall be placed around the perimeter of all openings and shall be spaced not more than 3 feet apart and within 1 foot of the opening.

Miscellaneous Details.—Except for permissible chases and recesses, walls shall not vary in thickness between their lateral supports. When a change in thickness due to minimum thickness requirements occurs between floor levels the greater thickness shall be carried to the higher floor level. Where walls of hollow masonry units are decreased in thickness a course of solid masonry shall be interposed between the wall section below such point and that next above.

Chases in masonry walls shall not be deeper than one-third the wall thickness nor longer than 4 feet horizontally and shall have at least 7¾ inches of masonry in back of the chases and between chases and jambs of openings, provided that in dwellings not over two stories high, chases not over 4 inches deep, 30 inches wide and 24 inches high, may be built in 8-inch walls and provided that chases below windows may equal the width of the opening above. The back and sides of such chases in exterior walls shall be waterproofed and insulated.

When unprotected steel or combustible structural members frame into walls of thickness not greater than 12 inches, they shall project not more than 4 inches into the wall and shall be so spaced that the distance between embedded ends is not less than 4 inches. The space above, below and between such members shall be filled solidly with burnt-clay materials, mortar, concrete, or equivalent fire-resistive material to a depth of not less than 4 inches on all sides of the members.

Beams, joists, girders or other concentrated loads supported by a wall or pier shall have bearings at least 3 inches in length upon solid masonry not less than 4 inches thick or upon a metal bearing plate of adequate design and dimensions to distribute safely the loads on the wall or pier.

No wall of less than 12-inches nominal thickness shall be used to support a corbeled chimney. Such corbeling shall not project more than 6 inches from the face of the wall, and in all such cases the corbeling shall consist of at least 5 courses of brick. No chimney shall be corbeled from a hollow wall or wall of hollow units.

Masonry walls that meet or intersect shall be adequately bonded or anchored. Floors and roofs shall be securely anchored to masonry walls at intervals not exceeding 6 feet. The ends of all wooden beams or joists entering masonry walls shall be cut to a bevel of at least 3 inches in the depth.

The height of isolated piers shall not exceed 10 times their least lateral dimension.

No masonry shall be supported on combustible construction.

The masonry above openings shall be supported by well-buttressed arches or lintels of metal or masonry, plain or reinforced, which shall bear on the wall at each end for not less than 4 inches. Timber centering for arches may remain in place provided the opening is not over 4 feet wide and the timber at each end bears on the wall for a distance not exceeding 2 inches.

All masonry shall be protected against freezing for at least 24 hours after laying. No masonry shall be built upon frozen material.

Twin Cities (from page 91)

mixer are driven by a Le Roi gasoline engine. The crane is used to transfer the poured forms to storage and for the succeeding handling and loading operations.

Pipes over 36 inches and up to 48 inches in diameter are made in the yard. The concrete for these is discharged from the Besser mixer into a concrete bucket of the type used on construction projects. The same crane is used to handle this bucket and discharge the concrete into the Quinn forms. An electric vibrator is attached to the form to compact the concrete. These pipes are also handled and loaded by the crane. Testing of the pipes is done on a home-made 3-point compression machine.

All the hauling of the aggregates and the delivery of the pipes is done by Lambert trucks.

Leo Sexton is superintendent of this plant.

Krumhaus Plant Achieves Remarkable Day-In, Day-Out Production Record

Mr. Krumhaus

LIKE many another, Fred Krumhaus, owner of the Company, Waukesha, Wisconsin, became a concrete-block producer as a result of his contracting experience. Mr. Krumhaus had spent several years making blocks for his father, a building contractor, when he took time out to do his share in winning World War I. After the war was over he engaged in contracting exclusively until 1929, when he again began making blocks as a side line with such success that in 1937 he dropped his contracting business and concentrated exclusively on block manufacture.

The plant he now operates in a large barn-like building back of the attractive house on his 40-acre farm one-half mile east of the Waukesha city limits was built in 1930 and has

Lift-truck which transports loaded racks to curing room.

since been enlarged and improved several times. In 1939 a Number 9 Stearns Joltcrete block machine was installed. This machine is now used only to make standard blocks. The Clipper stripper block machine which it replaced is used for making rock-face blocks and other specials.

This plant has an interesting production record. The demand for its products had increased every year until 1943, when the building volume in this area began to drop off. Even so Mr. Krumhaus expects the volume for 1943 to be about equal to that of 1939 which, at the time, was considered a good year. This record of production was achieved with one-shift operation daily, any surges being taken care of by overtime operation. Even more notable is the fact that not a day's production has been missed the year around for the past six years, except when repairs or plant changes were in progress, a really remarkable record of steady employment.

The present slackened demand is being taken care of by reducing the plant crew from six men to three. Under this system the men stack blocks in the yard every morning and make them every afternoon. On the average, 1,700 blocks are being made in 4 hours with three men. Six men formerly made 3,500 blocks in 9 hours.

Mr. Krumhaus produces his own sand-and-gravel aggregates from a 10-acre deposit behind the plant. This has already been excavated at one point to a depth of 110 feet without reaching the bottom. Some of this material is sold but most of it is used in making the blocks. A Universal ½-cubic yard crawler shovel with a Waukesha gasoline engine loads a truck which hauls the material either to the block plant or to a small plant which makes plaster sand. At the latter the material is discharged into a hopper from which a bucket-elevator feeds it over a Universal vibrating screen into a truck-loading bin.

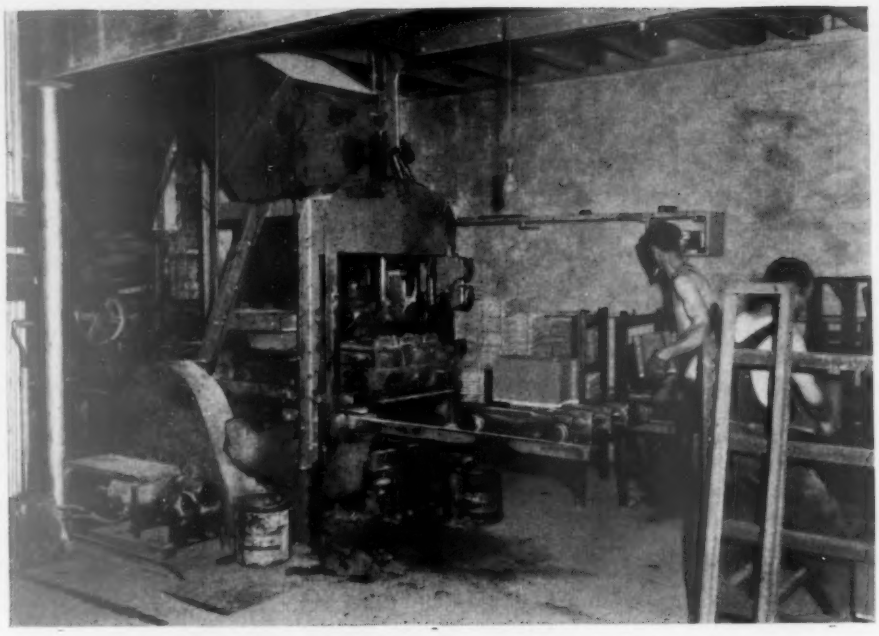
At the block plant there is a similar system of hopper, elevator and screen. The oversize from this screen drops into a New Holland jaw crusher followed by a New Holland roll crusher from which the crushed gravel drops into the same screen. The material passing through the screen drops into a bin over the block machines. The presence of crushed material in the aggregate has been no disadvantage, according to Mr. Krumhaus.

The aggregates are weighed in a

Screening unit which produces masons' sand.

hopper for recirculation over the batcher from which they are discharged into a 25-cubic foot Besser mixer. This serves both block machines. The steel racks used are handled by means of one Lewis-Shepard lift truck and one of Yale & Towne manufacture. There are two curing rooms for which steam is supplied by a 20-horsepower marine-type boiler equipped with a Hart-Parr automatic oil burner. The block-storage yard has a capacity of 150,000 blocks and

Plant and part of storage yard. Note attractive surroundings.



All standard blocks are now made on this machine.

loading and storing are made easy by the concrete walkways.

The concrete mixture is designed for a yield of 16 standard blocks per sack of cement. The blocks have an average compressive strength of over 1,500 p.s.i. net, which is far above the state requirement of 1,000 pounds.

Jaw and roll crushers for reduction of gravel.

It would be easy to get 19 or more blocks per sack and still be comfortably above the specified strength, but Mr. Krumhaus believes that a good block is his best salesman. Records are kept for his own satisfaction to insure a constant high quality of block with the result that the yield will not vary more than one-half block per sack of cement for months on end.

No salesmen are employed and no advertising is done. The quality of the blocks and Mr. Krumhaus' own contacts have been sufficient to keep things going at a rate satisfactory to him. The attractive plant and house, with its well-kept lawn, orchard, etc., are indications of the quality of the blocks made. In front of the house is the company's only advertisement, a dignified signboard.

The chief outlets for the company's products have been war and housing projects as far as 130 miles from the plant. Recently defense housing has predominated. One big project for which blocks were recently supplied is a hemp plant, one of six recently built in southeastern Wisconsin. Hemp had been a local product for some years in this area to supply Waupun prison. In the past year farmers have been induced to plant enough hemp to keep these plants going to replace the imported hemp which the Japanese cut off.

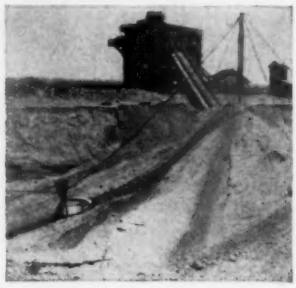
Producers in Ohio Form Association

Formation of the Bituminous Concrete Producers Association of Ohio has been announced by G. F. Atkins, its executive secretary.

Officers are: E. E. Knorr, of Max J. Zeller, Inc., Columbus, president; P. R. Anderson of the Marble Cliff Quarries Company, Columbus, vice-president; H. H. Brandon of the Clinton Construction Company, Wilmington, secretary-treasurer; and V. K. Gamble of the Allied Corporation, and J. E. Phelps of the Ohio Engineering Company, directors.

Mr. Atkins said the association, a non-profit organization, will disseminate practical and technical knowledge relating to bituminous concrete.

Move More for Less



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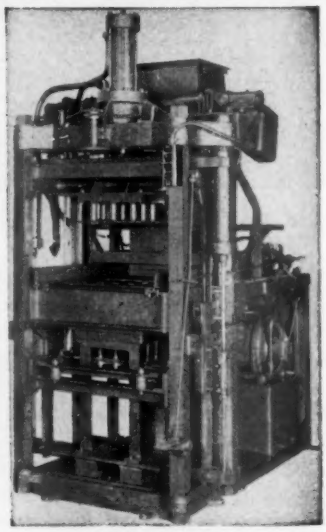

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Committees Work on Price Controls for Ready-Mix, Products Industries

WITH the permission of Fred Bamman of the OPA, Vincent P. Ahearn, executive secretary of the National Ready Mixed Concrete Association, has released for publication a report on the meeting of the Industry Advisory Committee for Ready Mixed Concrete and Concrete Products held under OPA auspices in Washington on September 15 and 16. This committee, by its own action, divided itself into four subcommittees: one for concrete masonry, one for concrete pipe, one for precast stone, and one for ready-mixed concrete. The committee elected its own officers: Chairman, J. W. Porter, Dallas, Texas; vice-chairman, Clarence F. Ehle, Cleveland; secretary, E. E. Brainard, Ampere, New Jersey; treasurer, T. J. Kauer, American Concrete Pipe Association, Washington. The members of the ready-mixed-concrete subcommittee are Paul P. Bird, Boston; Joseph H. Dixey, New York; Clarence E. Ehle, Cleveland; Herbert Jahncke, New Orleans; and H. F. Thomson, St. Louis. Joseph Moore, Fred Bamman and Roy Parsons represented the OPA at the September 15 and 16 meetings.

The OPA representatives outlined to the committee the statutory obligation of the OPA to develop specific price controls and mentioned the features which must be incorporated in special price orders, according to Mr. Ahearn's report. It was pointed out also that OPA had a basic policy of cancelling out the General Maximum Price Regulation (MPR 188 as an amendment of the GMPR) and substituting therefor special price orders which are geared to the realities of specific industry regulations. When the GMPR was released on April 28, 1942, it was designed only to bridge the gap until each industry brought under GMPR at the time could have a special price order, in the event it was found that such a special price order would contribute to the public interest and would simplify the administrative tasks of OPA and the industry concerned.

Under OPA procedures the committee was not confronted with any definite proposal for a specific price order for the ready-mixed-concrete industry. There were some suggestions offered by OPA representatives as to the form and phraseology of such a special price order, and the purpose of Mr. Ahearn's report is to single out some of the matters to which the committee gave consideration and to comment on certain features which will undoubtedly be incorporated in a special price order for ready-mixed-concrete if OPA, after a careful review of all relevant factors, decides that the GMPR and MPR 188 should be vacated, so far as that industry is concerned, and replaced by an order with specific controls. The OPA has not committed itself to any definite approach to the problem; everything is still in the discussion stage.

After a general discussion at the initial meeting on September 15, the committee took a recess until September 16, in order to give the four subcommittees an opportunity to consider the attitude of their respective industries on the various points made by the OPA representatives, and to arrange for a statement from each of the four industries on the following day. The ready-mixed-concrete subcommittee met and reviewed the whole problem. Mr. Thomson was appointed spokesman for the group. Summarizing some of the points which he made in behalf of the ready-mixed-concrete industry, speaking for a unanimous subcommittee,

1. The suggestion was made by OPA that the special price order shall not modify prices established pursuant to the GMPR or MPR 188, but that maximum prices for ready-mixed concrete which were established after the effective date of the proposed order shall be determined in accordance with the prescribed formula, which consisted principally of the provisions of MPR 188.

While there is some confusion in the ready-mixed-concrete industry with respect to application of GMPR and MPR 188 to specific price problem situations, it was the feeling of the subcommittee that the restatement of the provisions of GMPR and MPR 188 will not eliminate those uncertainties.

The OPA proposal was pointed toward the desirable end of facilitating the establishment of price control at ready-mixed-concrete plants not in existence in March 1942, but the era of new, and particularly temporary, plants in the ready-mixed-concrete industry has passed, and from now on the bulk of the output of the industry is coming from permanent or semi-permanent plants. The industry is experiencing rapidly declining volume because the "peak" of war construction is over.

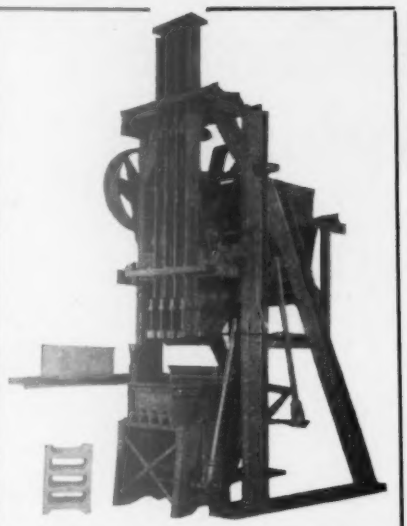
Strong competitive forces have kept ready-mixed-concrete prices below excessive and unreasonable levels even while the demand was reaching unprecedentedly high records. So far as information available to the subcommittee is concerned, there were no large number of complaints against ready-mixed-concrete prices even in high-demand periods, due to the uninterrupted functioning of normal competition.

It seems appropriate to the subcommittee to point out that the industry competes, in effect, with its own customers, most if not all of whom are fully competent to mix their own concrete at the site of the work if they feel that ready-mixed-concrete prices in a specific case are disproportionately high. Furthermore, these customers of the ready-mixed-concrete industry know exactly what its material costs are and they are competent to check immediately the reasonableness of any price which any member of the industry might name.

It was therefore the feeling of the subcommittee that the public interest has had strong protection at all times against unduly high ready-mixed-concrete prices, and it saw no compelling reason for the writing of a special price order unless that order simplified the administrative requirements in the industry, removed confusion and misunderstanding, and gave sympathetic recognition to the fact that, at the time of a precipitate decline in ready-mixed-concrete demand, there was a need for expediting and simplifying price relief. The subcommittee did not believe that the draft met this fundamental objective.

It was stated by the subcommittee that the industry has been required to absorb increased cost of materials and labor since March 1942, and that it has had to pay higher freight rates on inbound material movements and to pay taxes—federal and state—which have added to the cost of doing business in this industry. Frequently these increased costs could not be passed along to customers, either because of OPA policies or because of an aggressive competitive situation. There seemed to be nothing in the proposed draft, in the opinion of the subcommittee, which gave any adequate consideration to the fact that the industry, as demand declines so sharply and as the cost of doing business mounts, will be in urgent need of having a better means of obtaining price relief, thus insuring the continued functioning of the ready-mixed-concrete industry for the important construction work still being prosecuted in many areas.

2. Another OPA proposal was a requirement that each producer shall file, on a date yet to be specified, with OPA's Building Materials Branch, Washington, D. C., "a copy of his current price list and discount schedules, or other statements setting forth his current selling prices for all classes of buyers, indicating in



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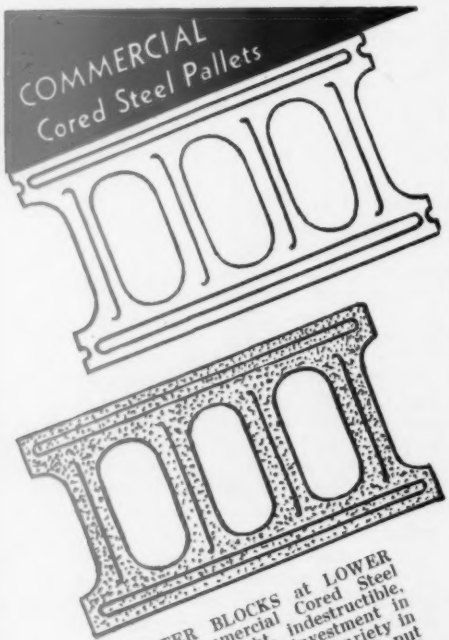

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It was recognized by the subcommittee that under MPR 188 the industry is already required to file prices for operations started since March 1942, but there is no price-filing requirement under GMPR for plants in operation in March 1942, and thus the proposed provision would make necessary, in many instances, the preparation and filing of price lists. Thus, the administrative obligations of the producer would be increased, although demands from war agencies for the maintenance of records and for the preparation and submission of reports are already imposing severe demands upon the industry which, in the ordinary case, does not have elaborate office staffs and which at the present time is working under a manpower shortage of crisis proportions.

The subcommittee felt that no "price list" could possibly anticipate the infinite variations of the situations which every ready-mixed-concrete company must face. It was the subcommittee's belief that realistic consideration should be given to the fact that this industry must give an immediate answer to any request from a contractor for prices and terms to produce ready-mixed concrete for a specific job. Every job, stated the subcommittee, has its own distinguishing characteristics, and if the producer wants to survive he must conduct his business on the basis that no job ever finds its exact duplicate. Concrete must be produced and delivered in sub-zero and 110-degree temperatures; it must be produced and delivered under all kinds of conditions for receiving the material, some taking little time and others taking a great deal of time. The industry must adapt itself to union situations and to non-union situations, and it must contend with unpredictable emergencies which the most comprehensive price list could not anticipate.

3. Another proposal for the determination of prices for permanent or temporary plants established after March 1942 was that the maximum price for such plants shall not exceed "the maximum price of his [that is, the operator of the permanent or temporary plant] most closely competitive seller of the same class for sales" at the site of the new location of the permanent or temporary plant, "based upon the most comparable type of sale of the same kind, grade, and quality of the commodity to purchasers of the most nearly comparable class;" . . .

It seemed to the subcommittee impossible for this industry to use such a formula. When the ready-mixed producer erects temporary plants, he does so to meet situations which have never arisen before and which may never arise again. There is no basis for the adoption of a competitor's price.

Substantially the same comment can be made with reference to permanent plants. Ready-mixed-concrete prices are tailored for the job, and even if the prices of competitors were fully known, these prices might have no relevancy whatever to the prices which the operator of the permanent or temporary plant would quote for specific jobs or for miscellaneous work.

4. The proposed definition of "temporary plants" included a stipulation that it would mean a plant "which has been moved to its location for the purpose of completing a specific and designated contract." OPA would draw a distinction between pricing arrangements for temporary plants and permanent plants by making the following provisions: "For the purpose of establishing maximum prices under this regulation, an increase in the dollar value of the original contract of not more than 10 per cent. shall be deemed to be within the bounds of the original temporary-plant contract and shall be priced on the basis of the original contract. In the event of an increase in the original temporary-plant contract price of more than 10 per cent. the producing facility shall be deemed to be a permanent plant, and a manufacturer must determine a maximum price for products produced at such plant in accordance with the provisions of this regulation applicable to permanent plant pricing."

It was felt by the subcommittee that this proposal would create an extremely difficult problem of administration. If it meant that increases of more than 10 per cent. over the total value of the original contract would make it necessary to submit an entirely new price application for consideration by the OPA, it was the judgment of the subcommittee that such a requirement would impose an unreasonable hardship on the industry, since as to the average project on which a temporary plant is set up, the war agencies are generally unable to say in advance just how much yardage the producer will be expected to turn out.

Members of the Advisory Committee include:

L. D. Bailey, president, The Cretox Companies, Elk River, Minnesota.
Paul P. Bird, president, Boston Sand & Gravel Co., Cambridge, Mass.
E. E. Brainard, treasurer, Lock Joint Pipe Co., Ampere, N. J.
H. W. Bush, vice-president, Multiplex Concrete Co., Inc., East Orange, N. J.
John S. Chase, president, Chase Building Products, Inc., Fort Worth, Tex.
W. E. Corbett, Corbett Concrete Pipe Co., Milford, Mass.
Joseph H. Dixey, vice-president, Transit-Mix Corp., New York City.
Clarence E. Ehle, superintendent, The Cleveland Builders Supply Co., Metropolitan Concrete Division, Cleveland.
Herbert C. Jahncke, manager, Jahncke Service, Inc., New Orleans.
H. H. Longenecker, president, Penn Building Block Co., Primos, Delaware County, Pa.
Deane R. Lynde, president, Cinder Concrete Products, Inc., Denver.
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Roy N. McCandless, president, Cinder Block, Inc., Detroit.
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H. F. Thomson, vice-president, General Material Co., St. Louis.
H. A. Weigand, chief engineer, California Concrete Products Co., San Jose, Cal.
M. L. White, president, Nollestone Co., North Hollywood, Cal.
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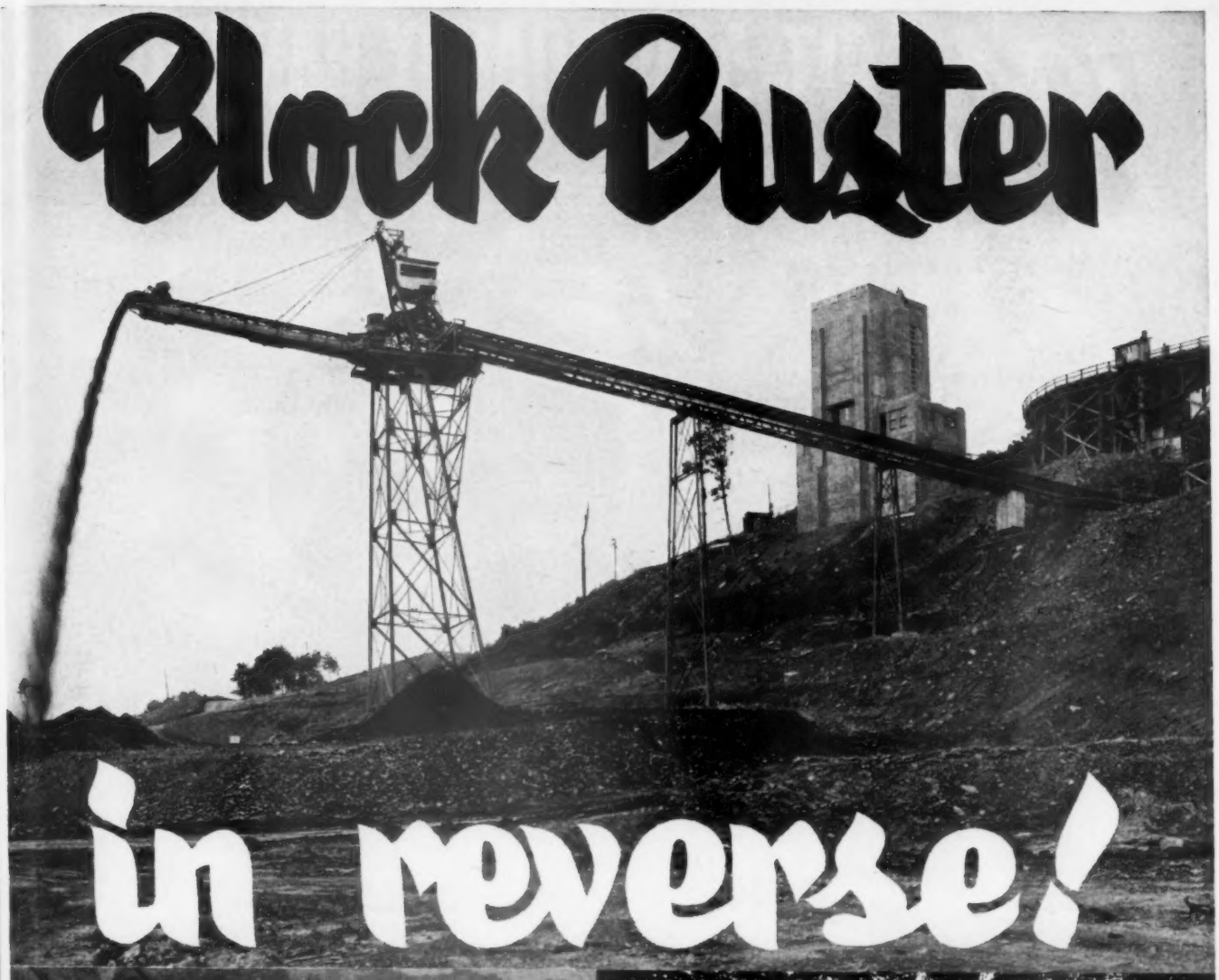

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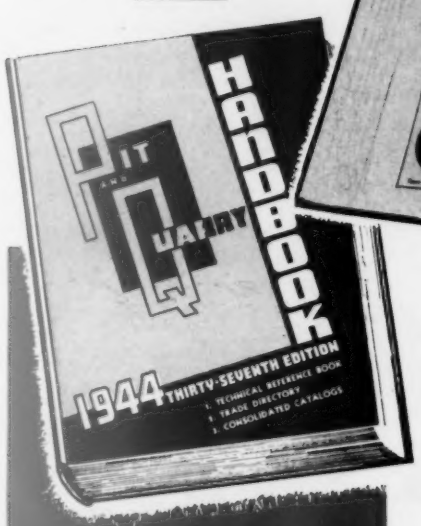

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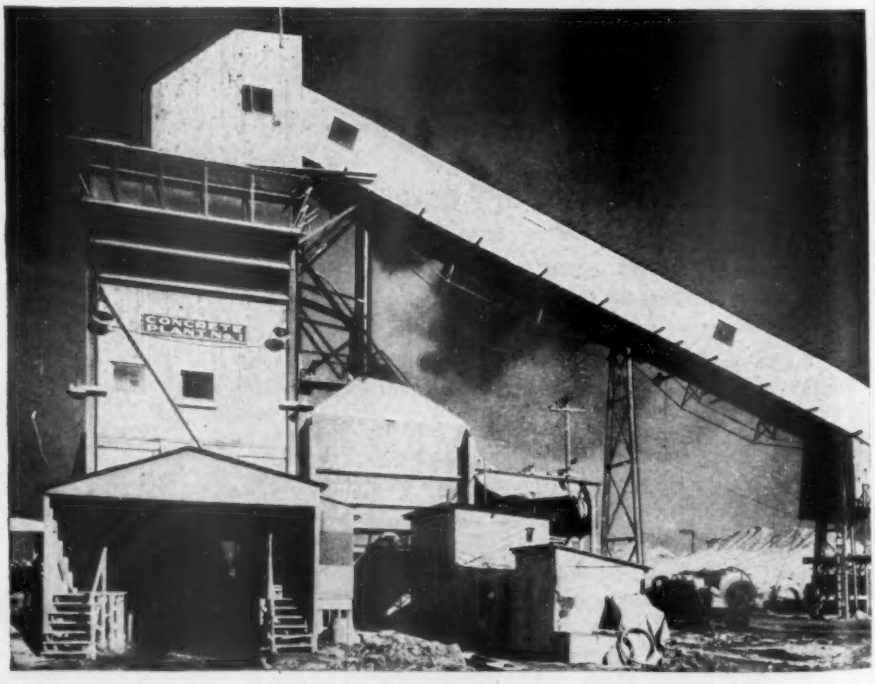

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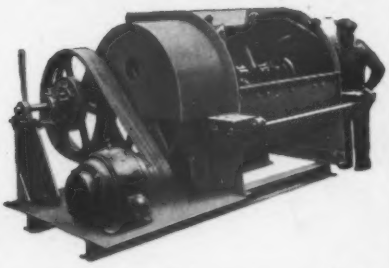

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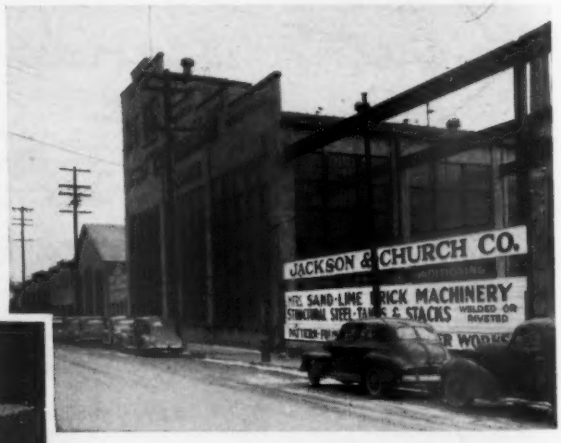

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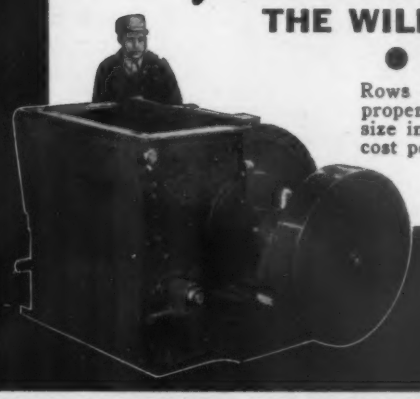

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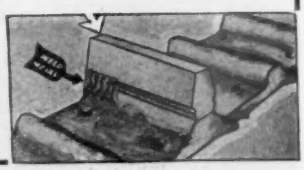

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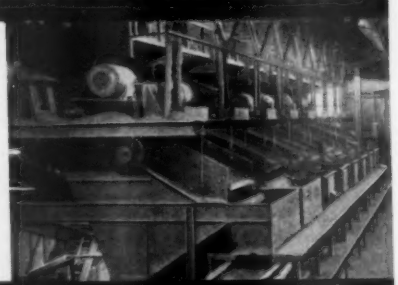

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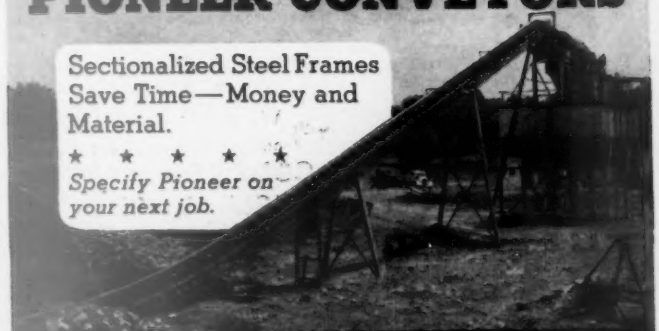

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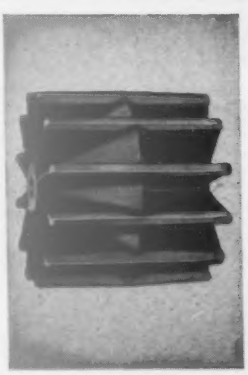

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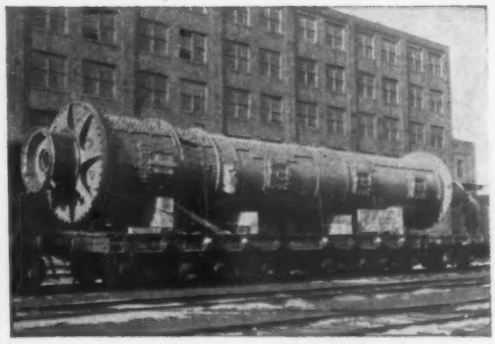

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1—#8745 Allis Chalmers Dry Grinding Compeb Mill, 45' long. This is a four compartment mill with the first compartment 10' long and 8' in diameter. The other compartments taper to 7'. The mill has chilled iron liners, and 36" table feeder, 72" Cutler Hammer Magnetic Clutch, and 3 compartment Dust Collector.

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1—¾ Yd. Osgood Shovel.
1—1 Yd. Marion No. 7 Steam Shovel.
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13—Western 3-Yard Side Dump Cars, 36" gauge

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24"x125'
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1—3½ x 44 ft.

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1—LIGHT PLANT, Master Model MG5, Gasoline-powered, 5 KVA, 1 phase, 60-cycle, 115 volts. Price..... **$430.00**

1—FLOOD LIGHTS, S&M 802, 9026 and 834. Will accept lamps 150 to 300 watts, 750 to 1,500 watts and 250 watts.

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1—PAVER, 27E, Koehring, complete with bucket, boom, and water tanks. Price **$1,500.00**

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1—GRADER, "Caterpillar" Model 66, Pull Type, 12′ Blade, hand controlled, leaning wheels. Price **$400.00**

1—MOTOR GRADER, "Caterpillar" Diesel No. 12..... **FOR RENT ONLY**

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1—CENTRIFUGAL PUMP, Rex 4″, 4 cylinder radiator-cooled gasoline engine, on two steel wheels. Price..... **$395.00**

1—CENTRIFUGAL PUMP, Jaeger 6P, 6-cylinder gasoline engine, 90,000 GPH, on 4 steel wheels..... **FOR RENT ONLY**

1—CENTRIFUGAL PUMP, Jaeger 6P, 6-cylinder gasoline engine, 90,000 GPH, on 4 steel wheels. Price..... **$1,075.00**

1—CENTRIFUGAL PUMP, Jaeger 4P, 4-cylinder radiator-cooled gasoline engine, 40,000 GPH, on 2 steel wheels. **FOR SALE OR RENT WITH OPTION**..... **$610.00**

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MISCELLANEOUS EQUIPMENT

1—BELT CONVEYOR, portable Barber Green, 24″ belt, 30′ long, powered by 12 H.P. Leroi engine, complete with track hopper ..... **FOR RENT ONLY**

10—NEW SALMANDERS, Danco. Each **$12.50**

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ASPHALT PLANT

Barber-Greene Asphalt plant complete for Hot or Cold Mixes.
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Mounted on pneumatic tires.
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Mounted on pneumatic tires.
(2) 45 HP vertical steam boilers, complete with piping.
(1) 3 compartment 35 ton feeder bin with oscillating platefeeders, extra drives and chain complete.
Excellent condition.

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Complete **PORTABLE WASHING AND SCREENING AND CRUSHING GRAVEL PLANT**
75 tons per hour, consisting of
One—double deck 3x10 Lippman Vibrating Washing screen
One—single deck 4x8 Smith Engineering Vibrating Scalping Screen
One—12x36 Lippman Jaw Crusher
Three—Complete steel sectional 24″ Belt Conveyors
One—steel, paddle type, Sand Drag Tank
One—two stage 3x4 Centrifugal Water Pump
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Backhoe for 50-B Bucyrus-Erie
Shovel for No. 4 Northwest
Shovel for 1¼-yd. Lorain
½-yd. Universal Truck Crane, pneumatics
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Caterpillar "50" Diesel Tractor
Ateco Bulldozer for Cat. "50"
"X" LeTourneau Scraper
2¼-yd. Page "C" Dragline Bucket
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Marion Steam Shovel Model 37
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Bucyrus-Erie Model 14-B Dragline
Bucyrus Model 50-B diesel crane, dragline and shovel
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Bucyrus Model D-2 crawler full revolving diesel crane and dragline
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P&H 600 gasoline driven shovel, crane and backhoe
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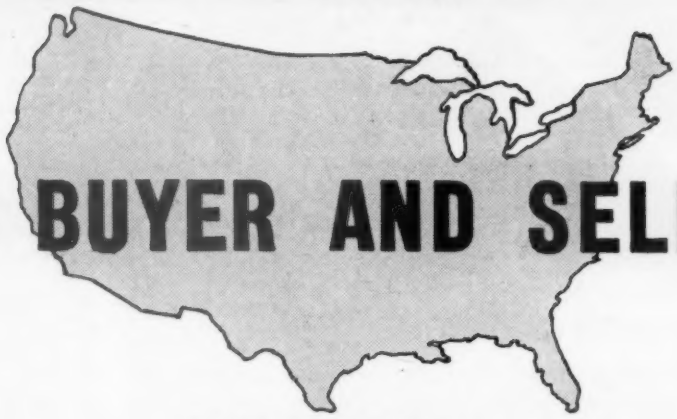

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CAPACITY ⅞ YARD

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BROWNING
one—30 ton
one—25 ton
one—20 ton
one—15 ton
each with 50′ boom
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one—20 ton with 50′ boom
McMYLER
one—20 ton with 60′ boom
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one—25 ton with 60′ boom
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Have several electric traveling gantry cranes and whirlies from 5 tons up to 35 tons.

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One—P&H 12 ton—45′ boom—10 wheeler
One—Northwest 18 with 60′ boom

TRACTORS
BULLDOZERS
GRADERS
TRUCKS
DUMP TRUCKS

TRACTORS

Several D8 and D7 Tractors with bulldozers and scrapers
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Complete detailed information on request

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SELECTION OF 220 BUCKETS
Clamshell
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in sizes of ⅜—½—¾—1—1½—2—3—5 yards

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1—Complete Buell Dust Collecting System with 6—3′-6″ diameter Hoppers, Tees, Elbows, Connecting Flues, etc. for 600 H.P. Waste Heat Boiler
1—5000 KW Westinghouse Turbo-Generator, complete with Condenser, Circulating Pumps, Air Washer, Oil Filter, Exciters, Switchboard, etc.
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1600 H.P. capacity—3 phase—60 cycles—440 and 2200 volt Motors, ranging in size from 2 to 200 H.P.
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1—20-ton General Electric Locomotive—600 Volt
Elevators
Drag Chains
Blowers
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5,000 feet of rubber belt from 24″ to 60″

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0-4-0 SADDLE TANK

Built	1917
Weight	32½ Tons
Tractive Effort	14400 lbs.
Boiler	ASME
General Repairs Completed	11/43
Location	Cincinnati, O.

Available for immediate shipment. Inspection invited and complete specifications available.

Locomotives, various types.

100—50-Ton Composite Gondolas.
50—30-Ton Flat Cars
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1 Yd. P&H 450 Gas Shovel or Crane. Rebuilt.
2 RD8 Cat. Diesel Tractors and 12 Yd. Scrapers.
International TD40 Tractor and 5 Yd. Scoop.
Cat. 65 Diesel Tractor with Euclid Bulldozer.
1500 ft. Sullivan Motor Driven Air Compressor.
75 to 500 HP Diesel Units. Various Types.
870 HP, 3 unit Diesel Generating Plant.

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1—No. 1030 Roller Bearing Overhead Eccentric Type CHAMPION.
3—No. 6 CHAMPION, 12″ x 26″ Jaw.
1—No. 4½ CHAMPION, 10″ x 20″ Jaw.
2—No. 4 CHAMPION, 9″ x 15″ Jaw.
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1—RELIANCE, 8″ x 14″ Jaw.
1—4½″ TRAYLOR Gyratory.
1—No. 2F TELSMITH Gyratory.

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1—1¼ Yard BYERS Master 5 Axel 60′ Boom and 1 Yard Shovel Front.
1—1¼ Yard BROWNHOIST Crane 75′ Boom.
1—¾ Yard BROWNING Shovel and Crane Combination—40′ Boom.

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WANTED

To Rent
1½ to 2½ yard
DIESEL SHOVEL

Must be in good serviceable condition.

Columbia Quarry Co.
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SLACKLINE CABLEWAY

85′ Steel Tower—150 H.P. Motor—2 yd. Bucket. Complete in every detail and in best of condition.

DEWATERING ELEVATOR

Link Belt—35½′ Centers—200 tons per hr. Dumps on 36″ picking belt 65′ long—All Steel Framework—Completely Equipped.

Kickapoo Sand & Gravel Company
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ROCK DRILLS

Condition guaranteed. Priced at 55% of new.

28 Gardner-Denver Drifters, Model AF99N, complete with 1¼″ round chuck with AF41B automatic feed, mounting for 36″ change, with DM 950 shell and DMC 770AX Hole spotter. (Described in Gardner-Denver Bulletin DD).
4 Worthington No. 175 sinker type Jack Hammers, 1¼″ chuck for lug steel.
3 Thor Model 75 Jack Hammers, 1″ chucks for hexagon steel.
2 Gardner-Denver Stopers, Model R91, automatic rotating, 1¼″ steel.

Each guaranteed in good operating condition. Priced at 55% of present new price. No priority required.

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300 CFM Chi. Pneu. with 75 H. P. motor
526 CFM Ingersoll-Rand, Style "JC"
599 CFM Ingersoll-Rand Type 10XB horiz. 2-st., 100# W.P., 150 H.P. 3/60/440 v. motor and starter, etc.
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CRUSHERS

24″ x 54″ Superior Crushing Rolls
#3 McCully Gyratory
#6 McCully Gyratory

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8—American Hoist & Derrick Co. double drum, motor driven with 40 H.P. A.C. motors

HOIST MOTORS

100 H.P. Northern G.E. Type 220 V D.C.
20 H.P. Northern G.E. Type 220 V D.C.

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Crushers—9x16; 10x20; 9x24; 9x36; 24x36
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Screens,—3x5; 3x6; 3x8; 4x8; 3x12
Power Units,—1½; 3; 5; 7½; 12; 40; 80 & 125 HP
Shovels,—Bay City ¾ yd.; Thew ¾ yd.
Cranes,—Koehring 301; Link Belt K-1

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Motor Truck Scales.....$440.00
Vibrating Screens $495.00
New—Immediate Delivery

Bonded Scale Company
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One (1) 36 x 6 Farrel Jaw Crusher Shop No. 11819 in good usable condition — location Morris Plains, N. J. For particulars address inquiries to:

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CONCRETE BATCHING PLANT

With 180 Ton 4 Comp. Steel Bin, 120 bbl. Cement Bin, aggregate weighing Batcher with 4 beam scale and indicator, volume Water Tank, 1000 lb. Cement Batcher 10" Screw Conveyor with motor. Priced to sell.

Johnson Machinery Co. 310 Keystone Ave.
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1—25 Ton Steel Stiff Leg Derrick, 70 ft. boom, 50 ft. mast with 2 drum Hoist.
1—20 Ton capacity Steel Stiff Leg Derrick, with 60' Boom and 49' Mast.
1—170 KVA Motor Generator with F. M. 228 HP Diesel engine for 220/3/60 AC.
1—1¼ Yd. P & H 600 Caterpillar Gas Shovel.
1—30 Ton Cap. Brownhoist Steam Locomotive Crane with 45' Boom, Code Boiler. Splendid operating condition.
1—2½ Yd. Diesel Dragline Caterpillar Crane with 60' Boom.
1—1 Yd. Marion Electric Shovel with Cummins Diesel Engine.
1—8 Ton Plymouth Gas Locomotive 36" Gauge Climax Engine.
2—1 Yd. 4 Blade Orange Peel Buckets.
1—¾ Yd. 3 Blade Orange Peel Bucket.
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1—1 Yd. Hayward Electric Clam Shell Bucket, **220 D. C.**
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1—No. 7½ McCully Gyratory Crusher.
1—No. 7½ Machinery Trailer.
1—8 Ton Morgan Single Drum Mine Hoist with 400 HP AC Motor.
1—8 Ton American Single Drum Mine Hoist with 400 HP AC Motor.
1—Columbia Scrubber Screen.
1—Symons 36" Disc Crusher.
1—11x22—No. 10A Acme Jaw Crusher.
1—No. 4 Austin Gyratory Crusher.
1—12" H & B Flap Valve.
1—No. 3 Williams Swing Hammermill.
30—No. 66 G.D. Pneumatic Clay Hammers.
30—G.D. Pneumatic Chipping Hammers.
10—G.D. Pneumatic Paving Breakers.
4—G.D. Pneumatic Tamping Hammers.
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Conveyor Belting...Transmission Belting...Elevator Belting...Fire, Water, Air, Steam, Suction or Welding Hose, etc.

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CARLYLE RUBBER PRODUCTS ARE NEW, GUARANTEED & LOW PRICED

CONVEYOR BELTING

ABRASIVE RESISTANT COVERS

Width	Ply	Top-Bottom	Covers
48"	8	1/8"	1/16"
42"	5	1/8"	1/16"
36"	6	1/8"	1/16"
30"	6	1/8"	1/16"
30"	5	1/8"	1/16"
24"	5	1/8"	1/32"
24"	4	1/8"	1/32"
20"	5	1/8"	1/32"
20"	4	1/8"	1/32"
18"	4	1/8"	1/32"
16"	4	1/8"	1/32"
14"	4	1/16"	1/32"
12"	4	1/16"	1/32"

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TRANSMISSION BELTING

HEAVY-DUTY FRICTION SURFACE

Width	Ply	Width	Ply	Width	Ply
18"	6	10"	6	6"	5
16"	6	10"	5	5"	5
14"	6	8"	6	4"	5
12"	6	8"	5	4"	4
12"	5	6"	6	3"	4

Inquire For Prices - Mention Size and Lengths

ENDLESS "V" BELTS

"A" WIDTH All Sizes | "D" WIDTH All Sizes
"B" WIDTH All Sizes | "E" WIDTH All Sizes
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FIRE HOSE

APPROVED SPECIFICATION HOSE
EACH LENGTH WITH COUPLINGS ATTACHED

Size	Length	Per Length
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	25 "	16.00
2"	50 "	23.00
	25 "	13.00
1½"	50 "	20.00
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Specify Thread On Couplings

SPECIAL OFFER . . . HEAVY DUTY
RUBBER HOSE

WATER HOSE
Each Length with Couplings Attached

I.D. Size	Length	Per Length
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1"	50 "	8.00
	25 "	6.25
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	25 "	7.50
	35 "	10.50
	40 "	12.00
	50 "	15.00
1½"	25 "	10.00
	35 "	14.00
	50 "	20.00

AIR HOSE

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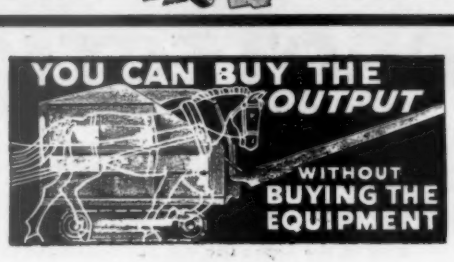

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SHOVEL

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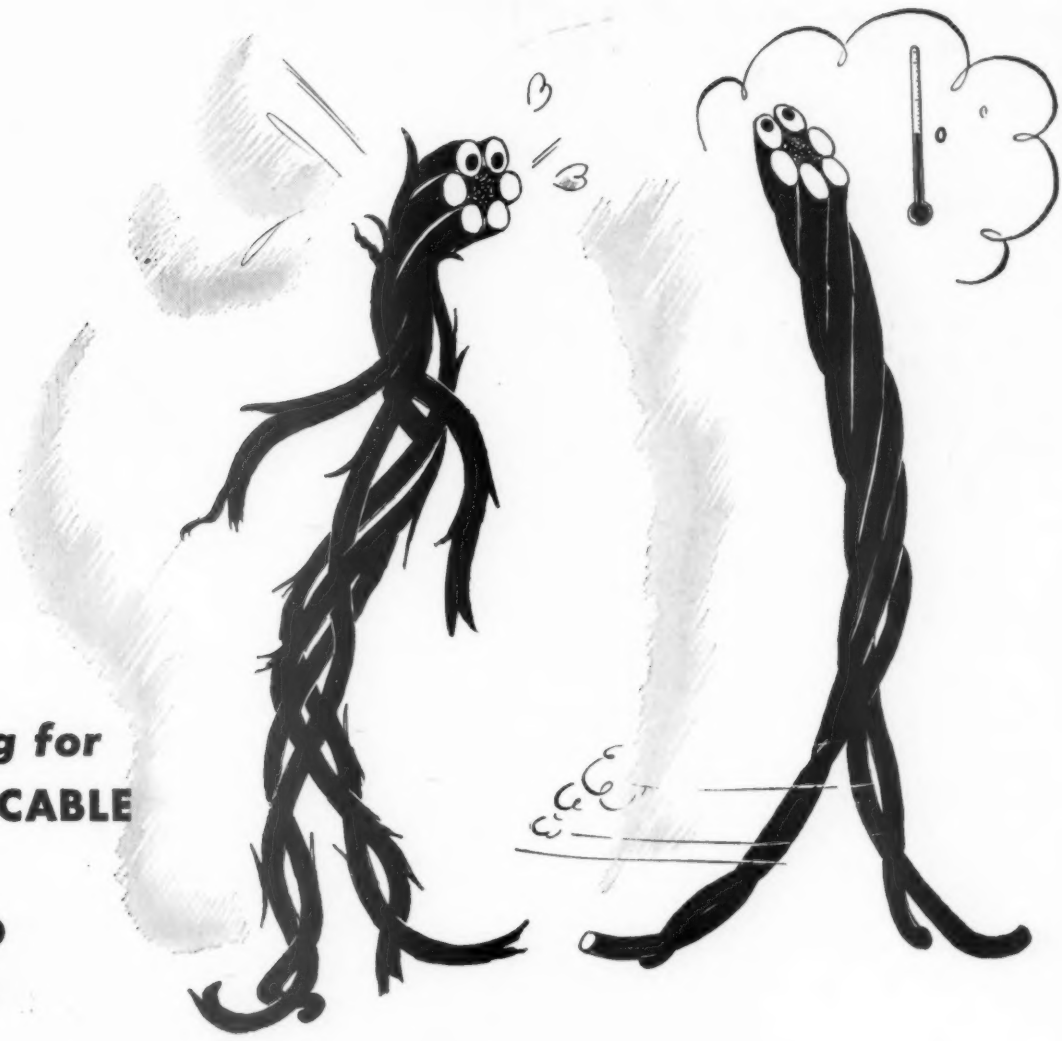


Keep asking for
AMERICAN CABLE
TRU•LAY
PREFORMED
WIRE ROPE

Because... it refuses to porcupine!

• When the outer wires of **TRU-LAY PREFORMED** finally break after long use, they do not "porcupine" and stick out from the rope as do the broken crown wires of non-preformed rope. They do not become dangerous, chisel-sharp jaggers that will tear men's hands even through stoutest gloves. Naturally this advantage enables men to work better with **TRU-LAY PREFORMED.** They handle it with speed and confidence. They know **TRU-LAY** is a much safer rope to handle.

TRU-LAY PREFORMED's refusal to porcupine affords protection for its own sake, as well as for sheaves, drums, and other equipment which can be injured by protruding wires. Thus, this single feature (one out of many) protects your workmen against dangerous, time-out accidents—extends the service life of your wire rope—reduces needless wear to your equipment.

No wonder the Armed Forces took so much of our production!

AMERICAN CABLE DIVISION

Wilkes-Barre, Pa., Atlanta, Chicago, Denver, Detroit, Houston, Los Angeles, New York, Philadelphia, Pittsburgh, San Francisco, Portland, Tacoma

AMERICAN CHAIN & CABLE COMPANY, INC.

BRIDGEPORT, CONNECTICUT

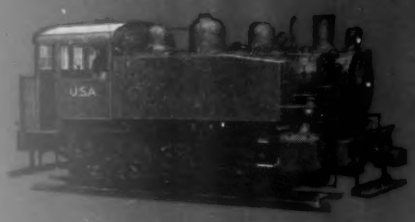
ESSENTIAL PRODUCTS... TRU-LAY Aircraft, Automotive, and Industrial Controls, TRU-LOC Aircraft Terminals, AMERICAN CABLE Wire Rope, TRU-STOP Brakes, AMERICAN Chain, WEED Tire Chains, ACCO Malleable Castings, CAMPBELL Cutting Machines, FORD Hoists, Trolleys, HAZARD Wire Rope, Yacht Rigging, MANLEY Auto Service Equipment, OWEN Springs, PAGE Fence, Shaped Wire, Welding Wire, READING-PRATT & CADY Valves, READING Electric Steel Castings, WRIGHT Hoists, Cranes, Presses... *In Business for Your Safety*

All over the World—

PORTER LOCOMOTIVES

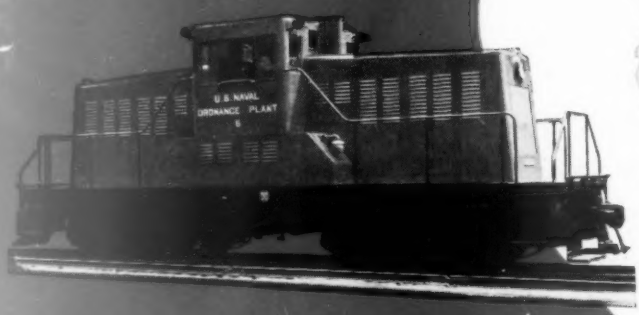
are helping

PASS THE AMMUNITION

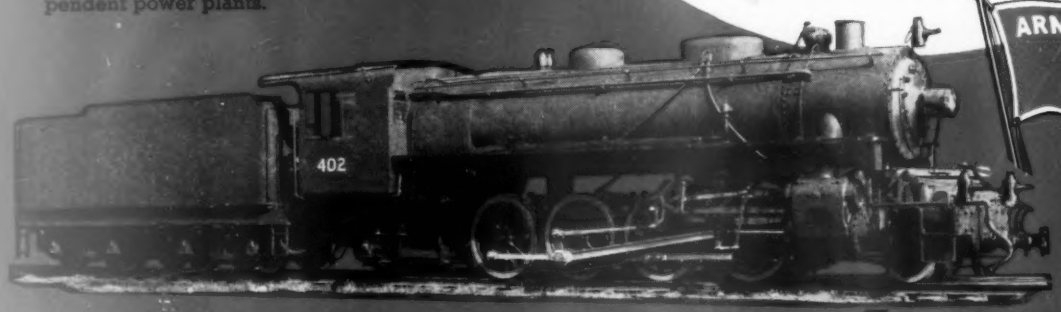


PORTER 0-6-0 50-Ton Steam Locomotive with side tanks, widely used for military and industrial switching.

In every theatre of the war, Porter Locomotives are to be found, somewhere behind the lines, keeping the everlasting stream of supplies rolling toward the fighting front.



PORTER Diesel-Electric powered by two independent power plants.



PORTER "Better Built" Equipment
Established 1866

PORTER 2-8-2 "Mikado" Type Steam Locomotive for long road hauls.

H. K. PORTER COMPANY, Inc.

PITTSBURGH, PENNSYLVANIA

FACTORIES:

PITTSBURGH, PA. — NEWARK, N. J.
BLAIRSVILLE, PA. — NEW BRUNSWICK, N. J.

LOCOMOTIVE DIVISION: Diesel, Diesel-Electric, Electric, Steam, and Fireless Steam Locomotives.

PROCESS EQUIPMENT DIVISION: Agitators, Mixers, Blenders, Autoclaves, Kettles, Pressure Vessels, Driers, Ball and Pebble Mills.

QUIMBY PUMP DIVISION: Screw, Rotex, Centrifugal, Chemical, and Steam Pumps.

ORDNANCE DIVISION: Projectiles, Heavy Forgings, Breech Blocks.